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RESEARCHES ON MULTIDISIPLINARY APPROACHES

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CONTENTS

pp. 1-20

Hüseyin Çiçeklioğlu / Ayşe Meriç Yazıcı / Mesut Öztırak / Osman Yılmaz

Artificial Intelligence (AI) and Employee Adaptation: Development and Validation of a New Scale

pp. 21-32

Nida Bayhan / İsa Bayhan

Good Practice Examples in Quality Assurance Activities: A Qualitative Research on the Times Higher Education Ranking Universities

pp.33-48

Nurcan Günce / Cengiz Güney

"Corporate Governance" In Members Of The Organization Of Turkic States: Bibliometric Overview Of Publications

pp. 49-62

Gökçe Akdemir Ömür

The Relationship Between Motivation and Organizational Commitment: A Meta-Analytic Review

pp. 63-72

Emre Seyrek / İbrahim Halil Çelik

The Relationships between Perceived Organizational Support, Workplace Happiness, Organizational Trust, and Positive Meaning of Work: A Moderated-Mediation Model

pp. 73-85

Meltem Özbay / Fırat Özbay / Saadet Sağtaş Tutkunca

Artificial Intelligence In Universities: A Study On Academics' Views

pp. 86-101

Furkan Çamiçi / Nida Palabıyık / Gökben Bayramoğlu

Reprogramming the Psychology of Success: The Reflections of Wearable Technologies in Athletes' Emotional and Motivational Dynamics

CONTENTS

pp. 102-115

Songül Demirkan
Green Office Practices: Sustainability Approaches in Office Management

pp. 116-125

Fatih Çağatay Baz / Şerife Keleş
Investigation of the Effect of Pop-Up Types Used in Shopping Websites on User Attitudes

pp. 126-141

Ahmet Erkasap / İsmail Özdemir
Comparison Of Agility Perception Between Industrial and Service Sectors

pp. 142-155

Nuran Varışlı / Münevver Bayar
Examining the Relationship Between Attitude Towards Artificial Intelligence, Readiness for Change and Intention to Leave

pp. 156-167

Nevin Karabıyık Yerden
The Relationship Between Cultural Products and International Marketing Strategies Towards Sustainability: A Research on the Textile Industry

pp. 168-175

Onur Oğuz
Effects of Economic Activities on Stock Market Prices: Case of Borsa Istanbul Sustainability Index

pp. 177-200

Begüm Al
Hybrid Work and Sustainable Employment: A Study on Female Employees in Türkiye

CONTENTS

pp. 201-210

Ali Yasin Kafes / Ayşe Hazal Dündar

The Effect of Sport Recreation Participants'Body Image Perceptions on Their Recreation Anxiety: The Role of Gender

pp. 211-222

Ayşe Şenay Koç

Approval-Seeking in Social Media: Moderating Role of Social Comparison and Cyber Values

pp. 223-239

Talha Turhan

National Identity and Conflict Perception: Azerbaijani Diaspora Students' Views on Russia's War in Ukraine

pp. 240-268

Yavuz Selim Balcıoğlu / Turhan Karakaya / A. Kürşat Merter

Beyond Income Constraints: Green Economy Transitions and Sustainable Development in Emerging Economies

pp. 269- 278

Hande Tasa / Süreyya Karsu / Meltem Nurtanış Velioğlu / Dilşad Çoknaz / Meftune Özbakır Umut

The Moderating Role of Close Support Between Online Purchase Intention and Behavior in Senior Adults

Research Article

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Artificial Intelligence (AI) and Employee Adaptation: Development and Validation of a New Scale[1]

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Abstract

This study aimed to develop a valid and reliable measurement tool to measure employees' awareness perceptions of AI integration and employee adaptation. In the first stage of scale development, in-depth interviews were conducted and a suggestion pool of 40 items was created as a result of content analysis. In the second stage, a draft item was created and the scale was structured by consulting expert opinions in order to ensure semantic, face and content validity. In the last stage, the scale was evaluated and a draft scale of 30 items was created. The draft scale was applied to 281 people working in the information technologies, education and customer service sectors. As a result of the analyses, it was determined that the scale had a one-dimensional structure and consisted of 6 items. Confirmatory factor analysis showed that the scale had an acceptable level of fit. According to the CFA results, it was seen that the factor loadings of the remaining 6 items in the scale were higher than 0.40 and the t values of all items were significant. The Cronbach Alpha coefficient for the entire scale was found to be 0.94 and the item-total correlation for all items was found to be higher than 0.30 (between 0.76 and 0.89). According to the validity and reliability analysis findings, the AI Integration and Employee Adaptation Scale was found to be a reliable and valid scale with its 6 items and one-dimensional structure.

Keywords: AI Integration, Employee Adaptation, Scale Development, Validation Study.

JEL Codes: M00, M1, O3

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1. Introduction

The rapidly increasing use of AI technologies in the business world indicates that business processes, leadership approaches, and employee behaviors need to be transformed (Brock and Von Wangenhelm, 2019; Enholm et al., 2022; Yazıcı and Sivaslıoğlu, 2024). In addition to increasing the operational efficiency of organizations, AI creates a new dynamic in human-machine interaction (Yazıcı, 2023). However, one of the biggest challenges encountered during the integration of this technology is how employees adapt to this change (Makarius et al., 2020; Arslan et al., 2022). While employees' adaptation processes to change play an important role in the success of businesses, there are limited studies in the relevant literature on how to measure this adaptation. For this reason, this study aims to address a comprehensive scale development study to understand the relationship between AI integration and employee adaptation.

The successful implementation of AI technologies in organizations is not only limited to the correct use of technology, but also includes the adaptation process of employees to these new systems (Brougham and Haar, 2018). Employees' perceptions of AI technologies, the extent to which they adapt to these technologies, and whether they resist this change are important for organizations to be successful in the long term (Ahmed et al., 2019). In this context, it is necessary to examine the relationship between AI integration and employee adaptation in the business world and to develop a measurement tool that can objectively evaluate this process (Brynjolfson and McAfee, 2014; Sullivan and Wamba, 2024).

AI technologies, one of the biggest and most important innovations of the digital age, are rapidly integrating into every aspect of our lives (Makridakis, 2017). The integration of AI not only offers technological innovations, but also leads to significant changes in a wide range of areas from business processes to education, from health services to art (Dwivedi et al., 2023). There are various studies emphasizing the importance of this integration. In studies detailing the importance of AI applications in strategic decision-making processes and the advantages provided by AI in areas such as data analytics, customer relationship management and automation, the impact of technology in increasing sustainable competitive advantage and power has been seen (Bessen, 2019; Kumar et al., 2024).

One of the clearest examples of AI integration and employee adaptation within the organization is related to task automation (Raisch and Krakowski, 2021). Increases in automation and efficiency levels are one of the most important advantages that AI applications provide to organizations (Javaid et al., 2022). For example, chatbots used in customer relationship management provide 24/7 service, increasing customer satisfaction and reducing costs (Jenneboer et al., 2022). In addition, thanks to machine learning algorithms and data analytics, organizations can obtain meaningful information from large data sets and align it with their strategies (Grover et al., 2018).

Integration of AI in the creation and improvement of organizational culture is of great importance in terms of developing employee competencies and improving business processes (Trushkina et al., 2020). AI -supported training and development programs increase employee skills and prepare them for the future of business (Rožman et al., 2023). In addition, AI-supported performance evaluation systems identify employees' strengths and weaknesses more objectively and help prepare personalized development programs (Frey and Osborne, 2017).

The aim of this study is to develop a reliable and valid scale to measure employee adaptation in the AI integration process. The ability of employees to adapt to new technologies is seen as an important factor in maintaining the competitive advantage of businesses. However, existing scales are generally examined under general headings such as technological competence or employee satisfaction, and the effects of a specific technology such as AI on the workforce are not addressed in detail. In this context, the scale presented by this study will provide both managers and researchers with the opportunity to measure the extent to which employees adapt to the AI integration process.

When the literature investigating the effects of AI integration on the workforce is examined, it is seen that the majority of existing studies focus on the contributions of AI use to operational efficiency and decision-making processes (Murugesan et al., 2023; Cramarenco et al., 2023; Perifanis and Kitsios, 2023). Artificial intelligence has become an important tool that increases productivity in human resources processes and supports strategic decision -making processes. Especially in areas such as recruitment, talent management and employee performance evaluation, artificial intelligence -supported systems provide more accurate and neutral decisions thanks to its major data analytics (Gao and Feng, 2023). For example, while artificial intelligence-based recruitment platforms accelerate the process of identifying the most appropriate candidates by analyzing the resumes of the candidates, it offers a more fair election process by minimizing the prejudice (Delecraz et al., 2022). In addition, artificial intelligence systems that support employees' career development provide personal education proposals by evaluating individual competencies and optimize corporate learning processes (Parveen and Alkudsi, 2024). These developments allow the adoption of more data-oriented and proactive approaches in human resources management, while providing innovative solutions that increase employee satisfaction and organizational commitment.

However, the role of employees in these processes, their ability to adapt, and the effects of these processes on job performance have not been sufficiently examined in the literature. Although there is a theoretical basis that employee adaptation is an important factor in the success of AI integration, an original scale has not been developed to measure this adaptation. This situation reveals the original value of the study. In this context, the scale to be developed will not only fill a theoretical gap, but will also provide a usable tool in the human resources management processes of enterprises.

2. Conceptual Framework

2.1. AI Integration and Employee Adaptation

While technology and digitalization are causing radical changes in the business world, AI technologies are at the center of this transformation (Malenkov et al., 2021). AI helps businesses achieve their strategic goals by providing speed, efficiency and cost advantages in business processes (Abousaber and Abdalla, 2023). However, the success of AI integration is directly related not only to the technological infrastructure, but also to the ability of employees to adapt to these innovations and new business models (Morandini et al., 2023). AI integration is reshaping the core functions of human resources management as a dynamic process that transforms the workforce. Especially in critical areas such as recruitment, talent management, and employee development, AI-supported systems make processes more efficient and data-driven (Dawson and Agbozo, 2024). AI is applied in a wide range of areas from candidate analysis to performance evaluations in the recruitment process, strengthening the role of human resources as a strategic business partner. In addition, AI-based training platforms that support employee skill development help the workforce adapt to changing job demands by providing personalized learning experiences (Regier and Grace, 2023). In this context, AI integration not only transforms business processes but also increases the impact of human resources management on organizational efficiency and employee engagement.

As a process that transforms the workforce, AI integration necessitates restructuring the way employees do business, job descriptions and learning processes. At this point, the concept of employee adaptation is important (Pan et al., 2023). AI creates great impacts on the operational processes of businesses through applications such as data analytics, machine learning and automation (Russell and Norvig, 2016). While these technologies automate repetitive tasks in business processes, they also allow employees to focus on more strategic and creative work. For example, AI-supported decision support systems improve business processes by helping employees make faster and more informed decisions (Sahoo et al., 2021; Yu et al., 2023). However, this technological transformation leads to changes in employees' duties, creates the need to develop new competencies, and brings various difficulties in business processes.

The adaptation process of employees to AI technologies is directly related to their perceptions, competencies and motivations. Adaptation to technology refers to the level of resistance or acceptance that employees show towards new systems and ways of doing business (Venkatesh and Davis, 2000; Kulkov et al., 2024). The extent to which employees adopt AI applications in this process, how they perceive the opportunities offered by technology and how effectively they can use these technologies in business processes determine the adaptation level of organizations.

The relationship between AI integration and employee adaptation is one of the most important issues that organizations face in the digital transformation process (Kahai et al., 2017; Frick et al., 2021; Trenerry et al., 2021; Gupta et al., 2024; Ali et al., 2024). Employees' reactions to technological change, their motivation levels and their participation in this process are the determining factors for the success of organizations in AI integration (Makarius et al., 2020). Employees' adaptation to AI technologies includes both cognitive and emotional adaptation processes. While employees on a cognitive level try to understand the impact of new technologies on business processes, they may experience anxiety, uncertainty and resistance regarding this change on an emotional level (Pereira et al., 2023). At this point, leaders need to provide support to their employees, effectively carry out change management and facilitate the adaptation processes of employees to technology (Suseno et al., 2023).

2.2. AI and Digital Transformation

AI technologies have become an important component of digital transformation in recent years. Organizations are integrating AI into their business processes to optimize processes, increase efficiency, and improve customer service. According to PwC's 2020 report, the global AI market is expected to contribute $15.7 trillion by 2030 (PwC, 2020). This huge economic potential causes organizations to invest more in AI in their digital transformation strategies. This potential of AI shows that it has created a serious transformation, especially in sectors such as industrial production, finance, and healthcare.

The impact of AI on digital transformation is directly linked to the automation of business processes and data analytics. According to a study by McKinsey, 75% of organizations' customer operations, marke-

ting and sales, software engineering, and R&D departments are using productive AI (McKinsey, 2023).

The digital transformation process requires organizations to reconsider not only technology but also their business models. Many organizations need to restructure their business processes to make them more flexible and agile when implementing AI-based solutions (Mihu et al., 2023). The role of AI in digital transformation also affects workforce dynamics. As traditional business processes become automated, the role of employees changes. In particular, routine and repetitive tasks are automated, while employees focus on more creative and strategic tasks (Davenport and Kirby, 2018). This creates the need for employees to acquire new skills and increases the demand for training programs. Therefore, the impact of AI on digital transformation covers both technological and human factors. The success of AI and digital transformation is not limited to investing in technology alone. Successful transformation is also related to the cultural adaptation of organizations. According to Gartner's 2023 report, 85% of AI projects fail to deliver the expected results due to organizational cultural change failure (Gartner, 2018). Therefore, during the digital transformation process, leaders need to develop strategies that will support employees' adaptation to this transformation while investing in technology.

2.3. Employee Adjustment and Adaptation Theories

While employee adaptation plays an important role in digital transformation processes, especially the integration of new technologies is directly related to how employees adapt to these technologies. According to Roger's theory of diffusion of innovations, while technological changes are integrated into the organization, employees adapt at different speeds depending on their level of openness to innovation (Gallivan, 2001). Lewin's theory of change is another important approach used to understand employee adaptation. According to this theory, organizational change occurs in three stages: dissolution, change and freezing (Lewin, 1951). During the integration of AI, employees need to get rid of old ways of doing business (dissolution) and adapt to the new technology (change). A successful adaptation process can be possible by making this change sustainable and permanent (refreezing).

Employees' capacity to adapt to technological change depends on various factors such as individual differences, organizational support, and training programs. According to Bandura and Adams's social learning theory, employees learn new technologies through observation and experience (Bandura and Adams, 1977). Especially during the integration of complex technologies such as AI, training and mentoring programs provided to employees accelerate adaptation. In a study conducted by IBM in 2024, 42% of employees stated that they adapted to AI technologies more quickly with appropriate training programs (IBM, 2024). Psychological factors such as motivation and job satisfaction are also of great importance in the adaptation process. Herzberg's dual factor theory suggests that increasing employees' motivation in the workplace will also make it easier for them to adapt to technological change (Herzberg, 1966). It has been observed that employees with high job satisfaction adapt to new technologies more quickly and experience less stress during this process (Judge and Bono, 2001). Therefore, taking into account motivation-enhancing factors in the adaptation process of employees can positively affect success.

2.4. Challenges Encountered in AI Integration

Although AI integration offers a great opportunity for organizations, it also brings with it various challenges. According to a published study, one of the most important challenges is employee resistance to adopting new technologies. The most important of these challenges is the resistance of employees to new technologies. The most important of these challenges is employee resistance to new technologies. According to a published study, 70% of AI projects fail due to employee resistance. This resistance stems from employee concerns about job security and lack of trust in the technology (Koo et al., 2021). Therefore, organizations need to develop proactive strategies to address these concerns during the AI integration process.

Another challenge of AI integration is the lack of necessary technical infrastructure. Many businesses must invest in data management, cloud computing, and other digital technologies before implementing AI-based solutions. However, 45% of small and medium-sized businesses state that they do not have the financial resources to invest in such technologies. This is seen as a significant obstacle that slows down the pace of AI integration. These challenges are especially pronounced in developing countries, and the digital transformation processes of organizations in these countries are slower (Kaur et al., 2023).

Another challenge experienced during AI integration is data privacy and security concerns. Organizations collect large amounts of data using AI-based systems, and it is important to process this data securely. According to McAfee's 2024 report, 67% of businesses experience data security concerns when implementing AI projects (McAfee, 2024). The integration of AI is a process that affects not only technical challenges but also organizational culture and leadership strategies. According to transformational

leadership theory, successful leaders motivate employees by clearly communicating their vision and facilitate their adaptation to technological change processes (Bass and Bass Bernard, 1985). However, it is stated that many leaders have difficulty managing this process and therefore fail in AI integration (Avolio and Yammarino, 2013). The challenges encountered in AI integration require a continuous learning and development process. Studies show that for AI projects to be successful, organizations must constantly learn new skills and adapt to technology (Regona et al., 2022). However, it has been observed that organizations that invest in training and development programs are more successful in the AI integration process. Therefore, the long-term success of AI depends not only on technology, but also on investing in organizational learning and cultural change (Morandini et al., 2023).

3. Development Process and Method of AI Integration and Employee Adaptation Scale

3.1.Problem of the Study

The efficiency, cost reduction and innovation opportunities that AI technologies offer to businesses are some of the elements that enable businesses to gain competitive advantage (Lee et al., 2019). However, the effective use of these technologies depends not only on the development of the technological infrastructure, but also on the adaptation of business managers and employees to these new technologies (Sjödin et al., 2021).

In most cases where AI integration fails or remains limited, the problem lies not in the technology itself, but in how employees adapt to these innovations. Employees' resistance to AI -based business processes, their lack of sufficient knowledge and skills, or their negative perceptions of these technologies are among the main problems that make AI integration difficult in businesses (Venkatesh and Davis, 2000). In this context, evaluating the level of adaptation of employees to AI integration is important in terms of developing strategies that will increase the success of this process.

The main problem of this study is that the adaptation levels of employees are not measured sufficiently during the integration of AI technologies into business processes and the impact of this adaptation on business activities is ignored. The adaptation of employees to AI technologies directly affects not only their individual performance but also the overall efficiency of the business, the speed of business processes and competitiveness. However, the limited measurement tools in the literature regarding the relationship between AI integration and employee adaptation create a lack of awareness on this issue. The main questions of this study are as follows:

RQ1: To what extent do employees adapt to the integration of AI technologies into business processes?

RQ2: What are the perceptions and attitudes of employees towards the changes caused by AI integration in business processes?

RQ3: What are the difficulties faced by employees who cannot adapt to AI technologies and how do these difficulties affect business performance?

RQ4: What strategies can be developed to reduce employees' resistance to AI technologies and accelerate their adaptation processes to these technologies?

Within the framework of this problem, the "*AI Integration and Employee Adaptation Scale*" aims to measure the level of adaptation of employees to AI technologies and to evaluate the effects of this adaptation on business performance. The scale to be developed will contribute to the more effective management of AI integration processes in the business world and will allow us to understand the effects of these processes on employee adaptation in more detail.

3.2. Scale Development Process

The three-stage scale development process suggested by Schwab was applied. The stages in the scale development process are: 1) Creation of the suggestion pool, 2) Structuring the scale, 3) Evaluation of the scale (Schwab, 2013).

3.3. Creating the Proposal Pool

In the first stage, academicians who are experts in business management, computer engineering, management organization, strategic management and management information systems were consulted regarding AI and collaboration leadership. A focus group was formed with the participation of these academicians and also managers/employees from information technologies, education and customer service sectors. In the meeting held with this focus group of 22 people consisting of academicians and sector employees, the important issues in measuring AI and collaboration leadership, the criteria to be used and the language to be used in the scale items were tried to be determined. In addition, interviews, one of the qualitative data acquisition methods, were conducted with the focus group members. In the interviews, content analysis was applied to the data collected with the help of semi-structured questions and a 40-item proposition pool was obtained. The proposition pool provided a comprehensive framework for measuring AI integration and employee compliance. The items created focused on important areas such as AI -based systems, digital collaboration tools, leadership strategies and

areas of use of innovative technologies. These areas generally focused on the basic areas covered by the concept of AI and collaboration leadership.

3.4. Creating the Proposal Pool: Expanded Details

The **Item Creation Stage** aimed to generate a comprehensive set of items that would effectively measure the integration of AI technologies and employee adaptation within business processes. This stage involved the collection of qualitative data through various methods, including expert consultations and interviews.

Below is an expanded explanation of the process:

Expert Consultations

A focus group consisting of 22 participants from diverse fields—academics in business management, computer engineering, management information systems, strategic management, and practitioners from sectors like information technologies, education, and customer service—were consulted to gather their insights on the key criteria and language for the scale items.

Thematic Categories for Scale Items: Based on the focus group discussions, four thematic categories were identified to structure the scale:

- **AI Systems:** How employees interact with and adapt to AI technologies used in the business.
- **Digital Collaboration Tools:** The role of AI-driven collaboration tools in the workplace.
- **Leadership Strategies:** How leadership styles and strategies can facilitate AI integration.
- **Innovative Technology Adoption:** The perception of AI technologies and their impact on business practices.

Interviews with Focus Group Members

In-depth, semi-structured interviews were conducted with focus group participants to gain a deeper understanding of their views on AI integration and employee adaptation. Some sample questions from the interviews included:

- *"What are the biggest challenges employees face in adapting to AI technologies in the workplace?"*
- *"How do you think AI-based tools will change the way employees collaborate and communicate?"*
- *"What role do leadership strategies play in easing employee resistance to AI technologies?"*
- *"Can you share examples of AI technologies you think employees would resist the most, and why?"*

Content Analysis and Coding Steps

The responses from the interviews were analyzed using content analysis to extract key themes, issues, and areas of concern regarding AI integration. The coding process followed these steps:

1. **Transcribing:** All interview data was transcribed for a detailed review.
2. **Initial Coding:** Responses were divided into units of meaning and categorized into thematic areas.
3. **Refining Codes:** Similar codes were grouped under broader categories to ensure alignment with the key themes (e.g., "resistance to AI", "employee training", "leadership support").
4. **Final Coding:** After discussions with experts, the refined categories led to the formulation of clear and concise items for the scale.

Example Items Generated

Based on the thematic categories, the following sample items were developed to be included in the proposition pool:

- *"I feel confident in using AI technologies to perform my daily tasks."* (AI Systems)
- *"The digital tools we use for collaboration help me work more efficiently with my colleagues."* (Digital Collaboration Tools)
- *"The leadership in my organization is actively involved in supporting AI adoption."* (Leadership Strategies)
- *"I believe AI will bring positive changes to the overall efficiency of my work."* (Innovative Technology Adoption)

These items focused on different aspects of AI integration, employee adaptation, and leadership, aiming to capture a broad spectrum of experiences and perceptions related to AI in the workplace.

Thematic Categories for Item Evaluation

The items were later classified into specific categories to guide the evaluation of employee adaptation to AI:

- **Technological Confidence:** Focuses on how confident employees feel in using AI tools and their ability to perform work tasks with the help of AI.
- **Collaboration & Communication:** Measures how AI tools influence collaboration among team members and communication within the workplace.
- **Leadership Influence:** Evaluates the role of leadership in facilitating the integration of AI and supporting employees in adapting to these changes.
- **Adoption and Change Perception:** Assesses

employee attitudes toward the broader organizational changes induced by AI adoption.

By adding these expanded details to the **Item Creation Stage**, we provide a clearer and more transparent view of the methodological process involved in the development of the **AI Integration and Employee Adaptation Scale**. This transparency enhances the credibility of the scale and helps ensure that it effectively measures the key aspects of employee adaptation to AI technologies in the business context.

3.5. Scale Configuration

A draft scale was created using a pool of 40 items. For this purpose, the opinions of six experts in the fields of Turkish language, business management, management information systems, strategic management, industrial engineering and computer engineering were consulted. Thus, the scope validity of the items in the pool of suggestions created in the first stage was tested. The purpose of testing the scope validity is to determine whether the items to be used for the features to be measured with the measurement tool are sufficient in terms of quantity and quality. Expert opinions are generally consulted to determine the scope validity. The experts consulted at this stage shaped the scale draft according to the standards of sensitivity of the scale, measurability, language integrity, scope and understandability. Thus, it was tried to ensure that the scale items addressed the basic issues related to AI and collaboration leadership, were compatible with different businesses and activities, and were based on concrete and measurable targets. In the applications to be carried out using the scale, it is important that the language of the scale items is clear, understandable and explicit so that the sample can easily understand the meaning of the items. According to the Lawshe method, the items with a scope validity rate of zero and below zero were eliminated from among the 32 items. The items created more than once on the same subject were deleted or combined. The meeting held to structure the scale was held in four stages. In the first session, the scale was reduced to 40 items, in the second session to 36 items, and in the third session to 32 items. In the fourth session, a 30-item draft scale form was obtained. The "AI Integration and Employee Adaptation Scale Draft Form" is presented in Table 1 below.

Table 1. AI Integration and Employee Compliance Scale Draft Form

	AI Integration and Employee Adaptation	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	Do you think you understand the basic concepts of AI technologies?					
2	Have you attended any workplace training programs on AI?					
3	How well do you understand the impact of AI technologies on your workplace?					
4	Do you know the specific tools and solutions that AI offers for your field of work?					
5	Do you think AI reduces your workload?					
6	Do you think you can produce more creative solutions with AI technologies?					
7	Do you think AI increases customer satisfaction?					
8	Do you think AI is effective in reducing errors?					
9	Do you feel any resistance to AI integration?					
10	Do you think AI technologies are changing the nature of your job?					
11	Have you received enough support to adapt to AI integration?					

12	How comfortable do you feel using AI technologies?
13	Do you think AI integration has increased your job satisfaction?
14	Do you think AI has made your job more meaningful?
15	Do you think AI technologies are reducing your stress levels at work?
16	Has working with AI boosted your workplace morale?
17	Are you aware of the decisions taken in the AI integration process?
18	Have sufficient educational materials been provided on AI technologies?
19	Have regular briefings been held on AI integration?
20	Have you received guidance on the use of AI technologies?
21	Are you worried that AI will take your job?
22	Do you think AI technologies are fair and transparent?
23	Do you believe that AI is being used ethically and responsibly?
24	Did you find management support sufficient during AI integration?
25	Do you think AI technologies are improving teamwork in the workplace?
26	Do you think AI is driving innovation in the workplace?
27	Have you encountered any technical problems during the AI integration process?
28	Do you think AI technologies make communication easier in the workplace?
29	Do you think AI is effective in standardizing business processes?
30	Do you feel like you can share your feedback about AI technologies in the workplace?

3.6. Evaluation of the Scale

A pilot study was conducted with a sample of 281 professionals working in the fields of information technology, education, and customer service. The collected data were analyzed to assess the scale's validity and reliability. To evaluate validity, factor analysis was performed, revealing a unidimensional structure. Reliability was examined through Cronbach's Alpha coefficient, which indicated a high level of internal consistency. The Cronbach's Alpha value was determined to be 0.94, with item-total correlation values ranging from 0.75 to 0.91, all exceeding the 0.30 threshold.

Based on these findings, the AI Integration and Employee Adaptation Scale has been confirmed as both a reliable and valid measurement tool in its finalized six-item, single-factor form. This newly developed scale is expected to serve as a valuable instrument for assessing employees' perceptions of AI and their awareness of collaborative leadership across various industries.

This process was followed in the development of the

AI Integration and Employee Adaptation Scale, and by ensuring the validity and reliability of the scale, the final form was transformed into a one-dimensional and 6-item form.

3.7. Target Group and Sampling Method

In the study, both online and face-to-face surveys were conducted in the last quarter of 2023 using the random sampling method. To use the survey questions related to the collection of data, firstly, "Ethics Committee Permission" dated 04.12.2024 and numbered 360 was obtained from Mersin University Ethics Committee. A total of 23 of the survey forms applied to the participants were found to be filled out incorrectly or incompletely and were excluded from the evaluation for this reason. Thus, 281 survey forms were evaluated in the information technologies, education and customer service sectors. According to Bryman and Cramer (2012), it is stated that in studies conducted for scale development, it is sufficient for the number of participants to be reached to be 5 or 10 times more than the number of questions used in the scale. The number of questions used in the scale in this study is 15. Since 15x10=150, the number of participants to be reached within the scope of this study must be at least 150. Therefore, reaching 281 employees in the information technologies, education and customer service sectors indicates that the number of participants is sufficient. The universe of the study consists of information technologies, education and customer service employees. The distribution of information technologies, education and customer service employees in the study according to demographic variables is shown in Table 2 below.

Table 2. Shows the Distribution of Participants According to Their Demographic Characteristics

Demographic Variables	Groups	n	%
Gender	Female	61	21,7
	Male	220	78,3
Marital status	Married	106	37,7
	Single	175	62,3
Age	21-24 years	32	11,4
	25-29 years	70	24,9
	30-34 years	89	31,7
	35-40 years	29	10,3
	41-44 years	35	12,5
	45 years and older	26	9,3
Education	Primary education	40	14,2
	High school	39	13,9
	Graduate	136	48,4
	Postgraduate	66	23,5
Duration in this workplace	1-5 years	69	24,6
	6-10 years	114	40,6
	11-15 years	70	24,9
	16 years and more	28	10,0
Working time with current manager	1-5 years	86	30,6
	6-10 years	118	42,0
	11-15 years	63	22,4
	16 years and more	14	5,0

Of the 281 employees who participated in the study, 21.7% were female and 78.3% were male. 37.7% of the participants are married, 62.3% are single. 11.4% of the participants are 21-24 years old, 24.9% are 25-29 years old, 31.7% are 30-34 years old, 10.3% are 35-40 years old, 12.5% are 41-44 years old, 9.3% are 45 years old and above. 14.2% of the participants had primary education, 13.9% had high school edu-

cation, 48.4% had undergraduate education, and 23.5% had graduate education. The working period of 24.6% of the participants is 1-5 years, 40.6% is 6-10 years, 24.9% is 11-15 years, 10% is 16 years and above. 30.6% of the participants have been working with their current manager for 1-5 years, 42% for 6-10 years, 22.4% for 11-15 years, and 5% for 16 years or more.

The descriptive statistics of the 30 items in the AI Integration and Employee Cohesion Scale item pool are given in Table 3. When the mean scores of the

Table 3. Descriptive Statistics of AI Integration and Employee Adaptation Scale Items

Items	X̄	SD	S.	K.
1- Do you think you understand the basic concepts of AI technologies?	3,40	0,79	0,48	0,47
2- Have you attended any workplace training programs on AI?	3,30	0,89	0,11	0,36
3- How well do you understand the effects of AI technologies on your workplace?	3,60	0,86	-0,61	0,89
4- Do you know the specific tools and solutions that AI offers for your field of work?	2,96	0,91	-0,42	0,75
5- Do you think that AI reduces your workload?	3,39	0,94	-0,32	0,27
6- Do you think that you can produce more creative solutions with AI technologies?	3,40	0,73	0,35	0,53
7- Do you think that AI increases customer satisfaction?	3,52	0,98	0,13	-0,24
8- Do you think AI is effective in reducing errors?	3,60	0,89	-0,57	0,62
9-Do you feel any resistance to AI integration?	2,98	1,16	-0,06	-0,70
10-Do you think AI technologies are changing the nature of your job?	3,53	0,98	-0,31	-0,21
11-Have you received enough support to adapt to AI integration?	3,40	0,73	0,35	0,53
12-How comfortable do you feel using AI technologies?	3,52	0,98	0,13	-0,24
13-Do you think AI integration increases your level of satisfaction in your job?	3,30	0,89	0,11	0,36
14-Do you think AI makes your job more meaningful?	3,60	0,86	-0,61	0,89
15-Do you think AI technologies reduce your stress level at work?	3,60	0,89	-0,57	0,62
16-Has working with AI increased your morale at work?	2,96	0,91	-0,42	0,75
17-Are you aware of the decisions made in the AI integration process?	3,30	0,89	0,11	0,36
18-Have sufficient educational materials been provided on AI technologies?	3,40	0,73	0,35	0,53
19-Have regular information meetings been held on AI integration?	2,96	0,91	-0,42	0,75
20-Have you received guidance on the use of AI technologies?	3,60	0,86	-0,61	0,89
21-Are you concerned that AI will take your job?	3,60	0,89	-0,57	0,62
22-Do you think AI technologies are fair and transparent?	3,41	0,77	0,55	0,36
23-Do you believe that AI is being used ethically and responsibly?	3,30	0,89	0,11	0,36
24-Did you find the support of management sufficient during the integration of AI?	3,40	0,73	0,35	0,53
25-Do you think that AI technologies improve teamwork in the workplace?	2,98	1,16	-0,06	-0,70
26-Do you think that AI increases innovation in the workplace?	2,96	0,91	-0,42	0,75
27-Did you encounter any technical problems during the integration of AI?	2,55	1,19	0,54	0,32
28-Do you think that AI technologies facilitate communication in the workplace?	3,41	1,20	-0,39	-0,56
29-Do you think that AI is effective in standardizing business processes?	3,53	0,98	-0,31	-0,21
30-Do you think that you can share your feedback about AI technologies in the workplace?	3,34	0,96	-0,60	0,50

S: Skewness K: Kurtosis

30 items in the AI Integration and Employee Compatibility Scale are analysed, it is seen that the AI integration and employee compatibility with the highest scores are '3 - Understanding the effects of AI technologies on the workplace' (3,60±0,86), '8 - Thinking that AI is effective in reducing errors' (3,60±0,89), '14-Thinking that AI makes your job more meaningful' (3,60±0,86), "15-Do you think that

AI technologies reduce your stress level at work" (3,60±0,89), "20-Receiving guidance on the use of AI technologies" (3,60±0,86), "21-Being worried that AI will take your job away" (3,60±0,89); The lowest score of AI integration and employee harmony belongs to the statement '27-Have you encountered technical problems in the process of AI integration' (2,55±1,19).

4. Method

In this study, statistical analyses were conducted using SPSS 21.0 and AMOS 22.0 software. To assess the validity and reliability of the developed scale, multiple statistical techniques were employed, including exploratory factor analysis (EFA), confirmatory factor analysis (CFA), item-total correlation analysis, and Cronbach's Alpha reliability measurement.

Exploratory factor analysis (EFA) is a widely used multivariate statistical method that identifies underlying constructs by grouping interrelated variables into meaningful factors (Çokluk et al., 2010). The first step in EFA involves testing the suitability of the dataset using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Sphericity Test. A KMO value above 0.70 and a p-value below 0.05 in Bartlett's test indicate that the data is appropriate for factor analysis. Among the available factor extraction techniques, principal component analysis (PCA) is the most frequently used method. To enhance interpretability, the orthogonal rotation technique, particularly the varimax method, is often preferred.

Following varimax rotation, factor loadings of the items are examined to determine their alignment with respective factors. Items should ideally exhibit high loadings (above 0.40, though in some cases, 0.30 may be acceptable) on a single factor while showing minimal cross-loadings on others. If an item loads on multiple factors, the difference between the highest and second-highest loading should be at least 0.10 to ensure distinct factor separation.

To determine the optimal number of factors, several statistical criteria are considered, including eigenvalues, total variance explained, and the scree plot. The scree plot visually represents the number of significant factors by identifying the point at which the slope of the graph starts to flatten. In single-dimensional scales, a total variance above 30% is generally sufficient, while higher variance percentages are expected for multi-dimensional constructs (Çokluk et al., 2010).

Confirmatory factor analysis (CFA) is an advanced statistical technique designed to test the validity of a predefined theoretical structure by examining latent variables within a model. It assesses whether the hypothesized factor structure aligns with the observed data. CFA is a key component of structural equation modeling (SEM), where ensuring model fit is a crucial step. Several fit indices are commonly used to evaluate the adequacy of the model, including the ratio of the Chi-square statistic to degrees of freedom (⍰²/df), the significance of individual parameter estimates (t-values), residual-based indices (SRMR, GFI), comparative fit indices (NNFI, CFI), and the root mean square error of approximation (RMSEA) (Çokluk et al., 2010).

For reliability assessment, Cronbach's Alpha coefficient is widely used to measure internal consistency, ensuring that all items in a scale contribute meaningfully to the overall construct. A Cronbach's Alpha value of 0.70 or higher is typically considered acceptable. Another method for reliability evaluation, item-total correlation, determines how well each individual item correlates with the total scale score. Items with a correlation coefficient above 0.30 are generally regarded as effective in distinguishing different response patterns among participants (Büyüköztürk, 2011).

Descriptive statistics were also used to summarize the demographic characteristics of the participants, with frequency and percentage distributions presented in tabular form. To further examine the dataset, the mean, standard deviation, skewness, and kurtosis values of the scale scores were analyzed. The skewness and kurtosis coefficients provide insights into whether the data follows a normal distribution, with values within the ±1 range indicating an approximately normal distribution (Büyüköztürk, 2011).

Since the total scale score demonstrated a normal distribution, parametric tests were applied to examine group differences. An independent samples t-test was used to compare mean scores based on gender and marital status, while a one-way analysis of variance (ANOVA) was employed to assess differences across age groups, education levels, tenure at the organization, and duration of working with the current manager. The significance level was set at $p<0.05$ with a 95% confidence interval to ensure robust statistical interpretations.

4.1. Exploratory Factor Analysis

4.1.1. Validity and reliability findings of AI integration and employee adaptation scale

When the correlation between the items in the scale was examined before the validity and reliability analysis for the AI Integration and Employee Compliance Scale (Appendix-1), it was determined that the correlation coefficient between many items was equal to 1 or higher than 0.90. Items with correlation coefficients higher than 0.90 with more than one item were gradually removed and 11 items remained in the scale. Validity and reliability analyses continued with the remaining 11 items. The KMO

value (0.839), which was examined for the suitability of the data obtained from 281 participants for the AI Integration and Employee Compatibility Scale in terms of explanatory factor analysis, was quite high and the Bartlett's Sphericity test statistic (Barlett's X2=2912.20; p<0.05) was statistically significant and it was understood that the research sample was sufficient. The scree plot analysis of the AI Integration and Employee Cohesion Scale, originally structured with five factors, revealed a shift towards a horizontal trajectory after the third point. This pattern suggests that the scale may be more appropriately represented with a two-dimensional structure (Figure 1).

Figure 1. AI Integration and Employee Compliance Scale Scree Plot

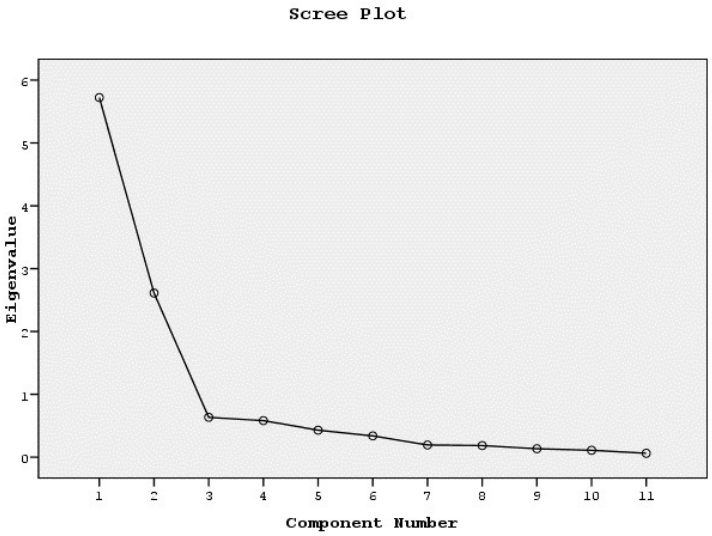


Table 4 presents the preliminary findings from the exploratory factor analysis performed on the AI Integration and Employee Adaptation Scale.

Table 4. AI Integration and Employee Compliance Scale Efa Findings-1

	Two Dimensions		One Dimensions		
Items	**Dimension**	**F2**	**11 items**	**10 items**	**6 items**
i1	**0,846**	0,179	0,831	0,704	0,758
i4	0,279	**0,845**	0,640	0,385	
i5	**0,903**	-0,105	0,848	0,737	0,816
i12	**0,871**	-0,043	0,791	0,647	0,741
i14	**0,894**	0,157	0,864	0,763	0,820
i17	**0,856**	0,256	0,877	0,774	0,806
i25	**0,584**	0,463	0,733	0,331	
i27	0,178	**0,917**	0,585	0,312	
i28	**0,844**	0,081	0,709	0,526	0,653
i29	0,168	**0,754**	0,203		
i30	-0,184	0,899	0,582	0,311	
Eigenvalues	5,723	2,612	5,723	5,690	4,650
Variance (%)	52,023	23,750	52,023	56,900	77,494
Total Variance	75,773		52,023	56,900	77,494
KMO	0,839				
Bartlett's Sphericity (X2)	2912,20				
df	55				
p	0,000				

In accordance with the 2 dimensions seen in the slope accumulation graph, it is seen that there are 2 factors with eigenvalues above 1. The variance explained by the first factor is quite high with 52,02%, while the contribution of the second factor to the variance is quite low (23,75%). When the item-factor relationship was analysed, it was determined that 7 items were in the first factor and 4 items were in the second factor. As a result of the EFA conducted with the unidimensional structure of the scale, it was determined that 1 item (i29) was eliminated in the first stage, 4 items (i4, i25, i27, i30) were eliminated in the second stage and 6 items remained in the scale. The variance explained by the six items was 77.49%. Although the total variance obtained in the structure of the scale consisting of two dimensions and 11 items is 75.77%, the fact that more total variance (77.49%) is obtained in the structure consisting of one dimension and 6 items shows that the unidimensional structure of the scale is more appropriate. In the confirmatory factor analysis, the structure consisting of 11 items and two dimensions as well as the structure consisting of one dimension and 6 items were checked and presented in Table 5.

Table 5. Model Fit Indices Obtained in Confirmatory Factor Analysis of AI Integration and Employee Fit Scale

Model Fit Indices	Reference Value1		Values obtained in this study			
	Good Fit1	Perfect Fit1	CFA 11 items 2 sub-scale	CFA 11 items 2 sub-scale*	CFA 8 items 2 sub-scale*	CFA 6 items 1 sub-scale
X2/df (p)	< 5	<3	15,162	14,974	13,016	2,443
SRMR	≤0,08	≤0,05	0,110	0,108	0,107	0,013
GFI	≥0,90	≥0,95	0,724	0,792	0,856	0,981
NNFI	≥0,90	≥0,95	0,743	0,747	0,789	0,986
CFI	≥0,90	≥0,95	0,806	0,843	0,887	0,993
RMSEA	≤0,10	≤0,08	0,225	0,223	0,207	0,072
Factor load	>0,40	>0,40	0,58 / 0,99	0,57 / 0,99	0,12 / 4,99	0,79 / 0,94
Covariance link count	-	-	-	6	4	2

1: (Çokluk et al., 2010) *: After appropriate covariance connections are made

The initial confirmatory factor analysis (CFA1) conducted for the two-dimensional structure identified through EFA revealed that the factor loadings were near 1, while the model fit indices were not within acceptable limits. Despite implementing six covariance connections based on modification recommendations, no significant improvement was observed in factor loadings or model fit indices. Consequently, items with extremely low factor loadings were removed from the scale. In the subsequent analysis, it was noted that certain items had excessively high factor loadings exceeding 1, and excluding these items caused the remaining factor loadings to surpass this threshold as well. Additionally, some items' factor loadings dropped below 0.40. Taking the EFA results into account, the scale was re-evaluated as a unidimensional structure with six items, which was found to be a more appropriate representation.

Table 6 presents the finalized factor loadings obtained from CFA, t-values of these factor loadings, as well as the item-total correlations and Cronbach's Alpha coefficients calculated for reliability assessment.

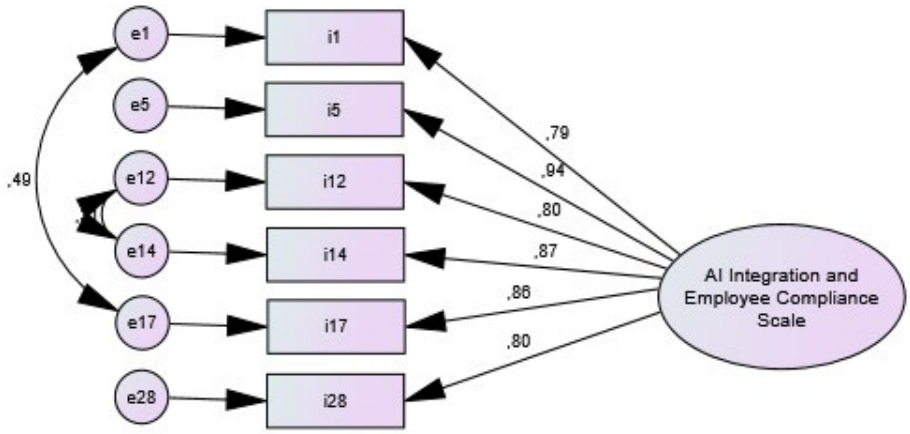
Table 5. Model Fit Indices Obtained in Confirmatory Factor Analysis of AI Integration and Employee Fit Scale

Item and Dimension	B	SE	Std. β	t	r	α
i1	1,000		0,79		0,795	0,94
i5	1,418	0,078	0,94	18,29**	0,888	
i12	1,264	0,085	0,80	14,90**	0,791	
i14	1,205	0,072	0,87	16,62**	0,860	
i17	1,225	0,054	0,86	22,72**	0,840	
i28	1,529	0,103	0,80	14,78**	0,756	

**p<0,01 r: Item total correlation

The CFA results indicate that the remaining six items within the single-factor structure exhibit factor loadings above 0.40, with all t-values reaching statistically significant levels. The overall reliability of the scale, as measured by Cronbach's Alpha, was calculated at 0.94, while item-total correlations ranged from 0.76 to 0.89, all exceeding the 0.30 threshold. Based on the validity and reliability analyses, the AI Integration and Employee Cohesion Scale demonstrates strong psychometric properties, confirming its reliability and validity as a six-item, unidimensional measurement tool.

Figure 2. AI Integration and Employee Fit Scale Cfa Diagram



5. Descriptive Findings

Table 7 shows the descriptive statistics of the AI Integration and Employee Adaptation Scale.

Table 7. Descriptive statistics of sub-dimensions and total scores of the AI integration and employee adaptation scale

					%95CI			
N	Min.	Max.	$\bar{X}$	SD	Lower	Upper	Skewness	Kurtosis
281	1	5	3,43	0,83	3,34	3,53	0,04	0,36

According to Table 7, the average score of the AI Integration and Employee Adaptation Scale was determined as 3.43±0.83. Considering that the lowest score on the scale is 1 and the highest score is 5, the participants' AI integration and adaptation is at a medium level.

6. Discussion

Studies on AI integration and employee adaptation reveal different approaches to how businesses manage the human factor in the digital transformation process. Studies in the literature focusing on the power of AI technologies to transform business processes generally emphasize the effects of these technologies on operational efficiency and cost advantages (Kraus et al., 2022). However, how employees adapt to these transformation processes and the processes of adapting to new skills have been addressed in a limited number of studies (Heim and Sardar-Drenda, 2021). The scale developed in this study fills this gap in the existing literature and provides an important tool for measuring the effects of AI integration on employees.

This research focuses on developing a specific measurement tool, unlike studies that address the professional and psychological adaptation processes of employees during the integration of AI technologies. For example, Bessen (2019) mentions employees' fear of losing their jobs and difficulties in adapting to changes in business models in his study on the integration of AI technologies into business processes. This study not only addresses these challenges but also contributes to the literature by providing a scale that measures how well employees adapt to AI integration.

Compared to other studies in the literature, another point where this research differs is that it approaches the adaptation processes of employees from a holistic perspective. While examining the effects of technological transformation on the workforce, Morandini et al. (2023) address the skill transformation created by the integration of AI, but do not focus on the psychological effects of this skill transformation on employees. The scale developed in this study provides a more comprehensive assessment by measuring both the professional skill acquisitions of employees and their psychological adaptation.

In the literature, the effects of AI integration on employees are mostly considered as an integrated process. In particular, the relationship between AI integration and the adaptation process of employees

is evaluated based on a single basic factor (Burhan, 2025). Although employees' adaptation to AI includes many elements such as individual competence, learning process, and organizational dynamics, these elements are not considered as discrete categories but as an intertwined structure (Tang et al., 2023). Therefore, considering the scale in a one-dimensional structure is also compatible with the theoretical framework.

In addition, organizational behavior and technology acceptance models provide theoretical foundations supporting the one-dimensional structure. In particular, the Technology Acceptance Model (TAM) developed by Davis (1989) suggests that the process of employees' adaptation to new technologies is shaped by two basic factors such as perceived usefulness and ease of use. However, these two factors create a combined effect on the process of employees' adoption of technology, and this is generally evaluated as a holistic structure (Venkatesh et al., 2003). Similarly, Bandura's (1986) Social Cognitive Theory addresses the interactions of individuals with environmental factors within a single learning process. In this context, the evaluation of employee adaptation to AI integration under a single factor overlaps with theoretical models that include both technological acceptance and individual adaptation processes.

Finally, the factor analysis results also support this integrated structure presented in the theoretical framework. The high explanatory power of the single-factor structure and the homogeneous distribution of factor loadings indicate that the scale is based on a holistic conceptual framework. In addition, it is suggested that the one-dimensional structure increases the applicability of the scale and is more functional in terms of practical use (Briggs and Cheek, 1986). Therefore, the one-dimensional structure of the scale used in this study is supported by both theoretical and statistical findings.

Especially today, when AI technologies are rapidly integrated into the business world, the success of the employee adaptation process has become important for organizations to achieve long-term competitive advantage. However, existing studies in the literature generally use general methods to measure the adaptation processes of employees to technological innovations (Brynjolfsson and McAfee, 2014). This study aims to close this gap in the literature by addressing employee adaptation in the context of the integration of a specific technology such as AI.

This study provides an original contribution to the existing literature by developing a scale to measure employee adaptation in the AI integration process. Compared to previous studies on employee adaptation, this study provides findings that are valuable both theoretically and practically. In this context, the developed scale will provide businesses with an effective tool to assess employee adaptation levels in the AI integration process, allowing them to better manage their workforce management processes.

7. Conclusion

Within the scope of this study, a valid and reliable scale was developed to measure the adaptation levels of employees to AI technologies. The AI Integration and Employee Adaptation Scale was determined as a 6-item one-dimensional structure through a three-stage process. Confirmatory and exploratory factor analyses confirmed the validity and reliability of the scale, and the Cronbach Alpha value was calculated as 0.94 in reliability analyses. These results show that the scale has high reliability.

As a result of the analysis, it has been revealed that AI integration and employee adaptation directly affect the performance and efficiency of businesses. Employees' attitudes towards AI technologies and their adaptation to these technologies contribute to faster and more effective management of business processes. In order for AI integration to be successful in businesses, it is of great importance that employees have positive perceptions of these technologies and actively participate in technological transformation processes. The effective use of AI technologies increases employee satisfaction and positively contributes to the overall performance of businesses. Employees' adaptation to AI technologies and their effective use of these technologies in business processes is an important key to the success of businesses in digital transformation processes.

8. Limitations

This study, although providing important findings, has some limitations. First, the research data were collected from specific sectors, and the findings cannot be generalized to all industries. Considering the sectoral scope of the study, employee adaptation to AI integration may vary across different business lines. It is recommended that future research overcome this limitation with large-scale studies covering different sectors. Second, considering the geographical and cultural context of the study, the findings are based on the business culture in a specific country or region. Employee responses to AI integration may be shaped by cultural factors, organizational norms, and work values. Therefore, studies conducted in different cultural contexts will be useful in testing the universal validity of the AI adaptation process. Finally, the cross-sectional design of the study limits the ability to observe changes over time. Employee adaptation to AI is a dynamic process, and longitudinal studies are necessary to understand the long-term effects.

9. Recommendations

9.1. Theoretical Recommendations

This study contributes to the literature examining the effects of AI technologies on the workforce and presents an original scale that measures the adaptation process. While existing studies on technology integration generally focus on business processes, there are limited studies measuring how employees adapt to these technologies. In this context, the proposed scale provides the opportunity to analyze workforce adaptation within a conceptual framework. Future research can conduct comparative studies on employee adaptation in different sectors using this scale and reveal differences between sectors. In addition, testing the scale with larger and different samples can further strengthen the validity and reliability of the scale.

The developed scale aims to measure the adaptation process of employees to AI integration and includes the basic dimensions that determine this process. In the literature, employee adaptation is addressed in three basic dimensions: cognitive adaptation, emotional adaptation, and behavioral adaptation (Li and Yeo, 2024). In this framework, the items in the content of the scale are designed to reflect individuals' perceptions, emotional reactions, and behavioral tendencies regarding the new technology. For example, factors such as individuals' willingness to adopt AI-supported systems, the confidence they feel in working with these systems, and ease of use represent the sub-dimensions of the scale (Zheng and Montargot, 2022). The meaning of scale scores and their role in managerial decision-making processes are also very important. The adaptation levels shown by the results can guide strategic decisions regarding AI integration in the workplace. For example, low scale scores may indicate that employees are resistant to technology and that more training or support mechanisms are needed (Arora et al., 2024). On the other hand, high adaptation levels reveal that employees have successfully integrated AI into their work processes and that this can increase productivity (Bîzoi and Bîzoi, 2024). In this context, the scale provides information not only at the individual level but also at the organizational level.

9.2. Practical Recommendations

In practice, this scale can be an important tool for human resources management and workforce planning. In particular, businesses that integrate AI technologies in digital transformation processes can use this scale to evaluate how well their employees adapt to this process. Employee adaptation is a factor that directly affects the success of technological integration, and this scale can guide businesses in improving this process. Based on the scale results, managers can develop additional training programs for employees who have adaptation problems or create motivational strategies. In addition, employees who can adapt to AI integration can contribute more to the overall success of the organization, so the use of the scale can also be an effective tool in employee performance management.

In practice, the use of this scale can be an important tool in human resources management and organizational transformation processes. Organizations can develop targeted interventions to increase employees' adaptation to AI using the data obtained from the scale. For example, customized training programs or supportive leadership approaches can be created depending on individual differences (Stone et al., 2024). As a result, the developed scale not only provides a psychometrically strong assessment tool, but also provides managers with the opportunity to better understand and improve employee adaptation processes.

9.3. Future Recommendations

This study was applied to the information technology, education, and customer service sectors. However, as AI technologies increasingly spread to more sectors, more extensive studies can be conducted on how employee adaptation is shaped in different industries (e.g., healthcare, finance, manufacturing). In particular, industry-specific challenges and opportunities may reveal sectoral differences in how employees respond to AI integration. AI integration and employee adaptation can be greatly affected by cultural context. Future studies can examine how employees in different cultural environments adapt to this process. In particular, differences between collectivist and individualist cultures can provide important findings on how adaptation processes to AI technologies are affected. The scale used in this study provides an instantaneous assessment. Future studies can conduct long-term follow-up studies to examine how employees adapt to AI integration over time. Thus, changes and developments in employee adaptation levels can be better analyzed with the continuous development and change of AI technologies. Studies can be conducted to investigate the effects of employee adaptation to AI integration on job performance, employee commitment, and organizational success. Using the scale in this context can more comprehensively reveal the effects of AI integration in the workplace on employee behavior and outcomes.

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Appendix 1:

Artificial Intelligence Integration and Employee Adaptation Scale 6-Item Single-Dimension Application Survey

Items	
1	Do you think you understand the basic concepts of AI technologies?
2	Do you think AI reduces your workload?
3	How comfortable do you feel when using AI technologies?
4	Do you think AI makes your job more meaningful?
5	Are you aware of the decisions made during the AI integration process?
6	Do you think AI technologies make communication easier in the workplace?

Appendix 2:

Correlation Table

	i1	i2	i3	i4	i5	i6	i7	i8	i9	i10	i11	i12	i13	i14	i15	i16	i17	i18	i19	i20	i21	i22	i23	i24	i25	i26	i27	i28	i29	i30
1	1	0,83	0,71	-0,3	0,73	0,91	0,67	0,7	0,59	-0,01	0,91	0,67	0,83	0,71	0,7	-0,3	0,83	0,91	-0,3	0,71	0,7	0,97	0,83	0,91	0,59	-0,3	0,37	0,62	-0,01	-0,26
2	0,83	1	0,76	-0,33	0,82	0,82	0,67	0,75	0,55	-0,14	0,82	0,67	1	0,76	0,75	-0,33	1	0,82	-0,33	0,76	0,75	0,87	1	0,82	0,55	-0,33	0,43	0,66	-0,14	-0,36
3	0,71	0,76	1	-0,42	0,81	0,72	0,79	0,98	0,56	0,01	0,72	0,79	0,76	1	0,98	-0,42	0,76	0,72	-0,42	1	0,98	0,73	0,76	0,72	0,56	-0,42	0,25	0,71	0,01	-0,31
4	-0,3	-0,33	-0,42	1	-0,36	-0,2	-0,32	-0,41	-0,48	0,45	-0,2	-0,32	-0,33	-0,42	-0,41	1	-0,33	-0,2	1	-0,42	-0,41	-0,29	-0,33	-0,2	-0,48	1	-0,81	-0,22	0,45	0,83
5	0,73	0,82	0,81	-0,36	1	0,76	0,76	0,8	0,42	0,02	0,76	0,76	0,82	0,81	0,8	-0,36	0,82	0,76	-0,36	0,81	0,8	0,77	0,82	0,76	0,42	-0,36	0,26	0,76	0,02	-0,27
6	0,91	0,82	0,72	-0,2	0,76	1	0,73	0,72	0,57	0,14	1	0,73	0,82	0,72	0,72	-0,2	0,82	1	-0,2	0,72	0,72	0,94	0,82	1	0,57	-0,2	0,23	0,68	0,14	-0,17
7	0,67	0,67	0,79	-0,32	0,76	0,73	1	0,78	0,56	0,12	0,73	1	0,67	0,79	0,78	-0,32	0,67	0,73	-0,32	0,79	0,78	0,69	0,67	0,73	0,56	-0,32	0,13	0,64	0,12	-0,24
8	0,7	0,75	0,98	-0,41	0,8	0,72	0,78	1	0,56	-0,01	0,72	0,78	0,75	0,98	1	-0,41	0,75	0,72	-0,41	0,98	1	0,73	0,75	0,72	0,56	-0,41	0,25	0,69	-0,01	-0,31
9	0,59	0,55	0,56	-0,48	0,42	0,57	0,56	0,56	1	-0,19	0,57	0,56	0,55	0,56	0,56	-0,48	0,55	0,57	-0,48	0,56	0,56	0,62	0,55	0,57	1	-0,48	0,48	0,39	-0,19	-0,49
10	-0,01	-0,14	0,01	0,45	0,02	0,14	0,12	-0,01	-0,19	1	0,14	0,12	-0,14	0,01	-0,01	0,45	-0,14	0,14	0,45	0,01	-0,01	0	-0,14	0,14	-0,19	0,45	-0,58	0,17	1	0,52
11	0,91	0,82	0,72	-0,2	0,76	1	0,73	0,72	0,57	0,14	1	0,73	0,82	0,72	0,72	-0,2	0,82	1	-0,2	0,72	0,72	0,94	0,82	1	0,57	-0,2	0,23	0,68	0,14	-0,17
12	0,67	0,67	0,79	-0,32	0,76	0,73	1	0,78	0,56	0,12	0,73	1	0,67	0,79	0,78	-0,32	0,67	0,73	-0,32	0,79	0,78	0,69	0,67	0,73	0,56	-0,32	0,13	0,64	0,12	-0,24
13	0,83	1	0,76	-0,33	0,82	0,82	0,67	0,75	0,55	-0,14	0,82	0,67	1	0,76	0,75	-0,33	1	0,82	-0,33	0,76	0,75	0,87	1	0,82	0,55	-0,33	0,43	0,66	-0,14	-0,36
14	0,71	0,76	1	-0,42	0,81	0,72	0,79	0,98	0,56	0,01	0,72	0,79	0,76	1	0,98	-0,42	0,76	0,72	-0,42	1	0,98	0,73	0,76	0,72	0,56	-0,42	0,25	0,71	0,01	-0,31
15	0,7	0,75	0,98	-0,41	0,8	0,72	0,78	1	0,56	-0,01	0,72	0,78	0,75	0,98	1	-0,41	0,75	0,72	-0,41	0,98	1	0,73	0,75	0,72	0,56	-0,41	0,25	0,69	-0,01	-0,31
16	-0,3	-0,33	-0,42	1	-0,36	-0,2	-0,32	-0,41	-0,48	0,45	-0,2	-0,32	-0,33	-0,42	-0,41	1	-0,33	-0,2	1	-0,42	-0,41	-0,29	-0,33	-0,2	-0,48	1	-0,81	-0,22	0,45	0,83
17	0,83	1	0,76	-0,33	0,82	0,82	0,67	0,75	0,55	-0,14	0,82	0,67	1	0,76	0,75	-0,33	1	0,82	-0,33	0,76	0,75	0,87	1	0,82	0,55	-0,33	0,43	0,66	-0,14	-0,36
18	0,91	0,82	0,72	-0,2	0,76	1	0,73	0,72	0,57	0,14	1	0,73	0,82	0,72	0,72	-0,2	0,82	1	-0,2	0,72	0,72	0,94	0,82	1	0,57	-0,2	0,23	0,68	0,14	-0,17
19	-0,3	-0,33	-0,42	1	-0,36	-0,2	-0,32	-0,41	-0,48	0,45	-0,2	-0,32	-0,33	-0,42	-0,41	1	-0,33	-0,2	1	-0,42	-0,41	-0,29	-0,33	-0,2	-0,48	1	-0,81	-0,22	0,45	0,83
20	0,71	0,76	1	-0,42	0,81	0,72	0,79	0,98	0,56	0,01	0,72	0,79	0,76	1	0,98	-0,42	0,76	0,72	-0,42	1	0,98	0,73	0,76	0,72	0,56	-0,42	0,25	0,71	0,01	-0,31
21	0,7	0,75	0,98	-0,41	0,8	0,72	0,78	1	0,56	-0,01	0,72	0,78	0,75	0,98	1	-0,41	0,75	0,72	-0,41	0,98	1	0,73	0,75	0,72	0,56	-0,41	0,25	0,69	-0,01	-0,31
22	0,97	0,87	0,73	-0,29	0,77	0,94	0,69	0,73	0,62	0	0,94	0,69	0,87	0,73	0,73	-0,29	0,87	0,94	-0,29	0,73	0,73	1	0,87	0,94	0,62	-0,29	0,36	0,64	0	-0,26
23	0,83	1	0,76	-0,33	0,82	0,82	0,67	0,75	0,55	-0,14	0,82	0,67	1	0,76	0,75	-0,33	1	0,82	-0,33	0,76	0,75	0,87	1	0,82	0,55	-0,33	0,43	0,66	-0,14	-0,36
24	0,91	0,82	0,72	-0,2	0,76	1	0,73	0,72	0,57	0,14	1	0,73	0,82	0,72	0,72	-0,2	0,82	1	-0,2	0,72	0,72	0,94	0,82	1	0,57	-0,2	0,23	0,68	0,14	-0,17
25	0,59	0,55	0,56	-0,48	0,42	0,57	0,56	0,56	1	-0,19	0,57	0,56	0,55	0,56	0,56	-0,48	0,55	0,57	-0,48	0,56	0,56	0,62	0,55	0,57	1	-0,48	0,48	0,39	-0,19	-0,49
26	-0,3	-0,33	-0,42	1	-0,36	-0,2	-0,32	-0,41	-0,48	0,45	-0,2	-0,32	-0,33	-0,42	-0,41	1	-0,33	-0,2	1	-0,42	-0,41	-0,29	-0,33	-0,2	-0,48	1	-0,81	-0,22	0,45	0,83
27	0,37	0,43	0,25	-0,81	0,26	0,23	0,13	0,25	0,48	-0,58	0,23	0,13	0,43	0,25	0,25	-0,81	0,43	0,23	-0,81	0,25	0,25	0,36	0,43	0,23	0,48	-0,81	1	0,1	-0,58	-0,83
28	0,62	0,66	0,71	-0,22	0,76	0,68	0,64	0,69	0,39	0,17	0,68	0,64	0,66	0,71	0,69	-0,22	0,66	0,68	-0,22	0,71	0,69	0,64	0,66	0,68	0,39	-0,22	0,1	1	0,17	-0,08
29	-0,01	-0,14	0,01	0,45	0,02	0,14	0,12	-0,01	-0,19	1	0,14	0,12	-0,14	0,01	-0,01	0,45	-0,14	0,14	0,45	0,01	-0,01	0	-0,14	0,14	-0,19	0,45	-0,58	0,17	1	0,52
30	-0,26	-0,36	-0,31	0,83	-0,27	-0,17	-0,24	-0,31	-0,49	0,52	-0,17	-0,24	-0,36	-0,31	-0,31	0,83	-0,36	-0,17	0,83	-0,31	-0,31	-0,26	-0,36	-0,17	-0,49	0,83	-0,83	-0,08	0,52	1

Correlations

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Research Article

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Good Practice Examples in Quality Assurance Activities: A Qualitative Research on the Times Higher Education Ranking Universities[1]

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Abstract

Higher education is a critical stage of education that contributes to societal progress by enhancing individuals' knowledge and skills. This study was conducted to investigate, evaluate, and contribute to the literature on good practices related to quality assurance activities of the top 50 universities listed in The Times Higher Education (THE) World University Rankings. Within this scope, qualitative research methods were employed to analyze the data, statements, and activities on the websites of the top 50 universities in THE rankings. The obtained data were categorized and classified according to the content analysis method, grouped into categories based on their relevance to the research problem, and descriptively expressed as themes. The study revealed that the universities under investigation have established coordination units, particularly in the areas of community service, sustainability, and online learning; organized student- and community-oriented events and training programs; and provided diverse working environments to enhance 21st-century skills among all stakeholders through the formation of teams and collaborative activities. Regarding equity, diversity, and inclusion, it was identified that these universities have developed specific mechanisms based on cultural and social values to support their diverse staff and student populations. The findings were discussed providing recommendations for higher education institutions.

Keywords: Quality, THE Ranking System, Higher Education and Quality.

JEL Codes: I23, I29

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1. Introduction

Higher education institutions are regarded as the central actors in social, economic, political, legal, and societal development, as well as in enhancing living standards at the international level. Universities, which undertake the most critical responsibilities on the path to becoming knowledge-based societies, strive to achieve their strategic objectives in education, research, and community service activities, along with cultivating qualified individuals (Günay & Günay, 2017; Özdağoğlu et al., 2020). While countries expect universities to contribute to the enhancement of national wealth on a global scale, they perceive these institutions as both scientific and social investments. Quality assurance plays an effective role in monitoring this investment for societal development and scientific progress, as well as in implementing improvement efforts based on feedback (Koyuncuoğlu, 2020). In this context, tracking the qualified work and good practices of universities operating at national and international levels and establishing collaborations contribute to disseminating scientific and social development across different regions and geographies.

Quality assurance in higher education is typically framed within a systematic and planned approach. The need for robust mechanisms to evaluate educational outcomes and achievements has been acknowledged in academic studies, and the challenges related to measuring transformations in student competencies have been widely discussed. It has been determined that effective quality assurance evaluations require access to fundamental and reliable data (Nabaho & Turyasingura, 2019). In this regard, Chen (2016) advocates systematic activities aligned with institutional objectives, emphasizing the importance of a structured approach to quality assurance. The systematic perspective on quality assurance in higher education, along with both internal and external mechanisms such as accreditation and self-assessment, has been identified as fundamental components of quality assurance frameworks (Hamutoğlu, 2020; Koyuncuoğlu, 2020; Nasim et al., 2019). The development of quality systems in the education sector has increasingly been associated with accelerating globalization and rising competition among higher education institutions (Nasim et al., 2019). Quality assurance efforts in higher education contribute to raising academic standards, producing qualified graduates, improving employment profiles, and reshaping community service processes. In this context, investigating and evaluating good practice examples regarding the quality assurance criteria of the universities included in the sample will support the identification of issues that can be considered with the universities' goals, objectives, plans, and processes.

1.1. The Concept of Quality and Quality Processes in Higher Education

When defining the concept of quality in higher education, it is essential to consider that educational processes possess a heterogeneous and abstract structure, necessitating a unique definition. Unlike quality in businesses, where the output is a final product, the quality of services provided by educational institutions must be determined (Hamutoğlu et al., 2020). Consequently, the conceptual aspects of quality processes in higher education have been addressed along with their distinctive features and outcomes. Elken and Stensaker (2018) emphasize the continuity between improvement and accountability within quality assurance discussions, while Sarrico et al. (2010) highlight the need to bridge the gap between quality assessment and performance evaluation. Researchers frequently underscore that a comprehensive understanding of these processes is crucial for enhancing quality assurance practices (Camilleri, 2021; Macheridis and Paulsson, 2021). Similarly, students' perspectives play a vital role in shaping discourse on quality. Jungblut et al. (2015) reveal that students perceive quality through multiple lenses, such as transformation and development, indicating that the relationship between educational experiences and perceived quality should not be overlooked.

The development and proliferation of quality practices in higher education have been nourished by the evolution of quality culture across different bodies of literature. Analyzing the relevant conceptual foundations and historical processes reveals that quality and standardization trace back to the Code of Hammurabi and the measurements performed by Aztec inspectors in ancient Egypt and Central America. During the Seljuk and Ottoman periods, various institutions set standards to ensure product quality, enacting legal regulations for quality assurance (Ergülen & Atcı, 2020). By the mid-18th and 19th centuries, systems for modern industry began to emerge, bringing advancements in productivity, quality, and system approaches. W. Edwards Deming (1900–1993) introduced the Plan-Do-Check-Act (PDCA) cycle, providing a systematic approach to quality processes (Anastasiadou, 2015). Joseph Moses Juran conveyed the "quality trilogy" to businesses seeking to enhance global competitiveness and deliver high-quality products and services (Gülnar, 2021). The core idea of the quality trilogy revolves around the notion that effective quality management is built upon three fundamental processes: quality planning, quality control, and quality improvement (Juran, 2005). Philip B. Crosby, a contemporary of Deming and Juran, defined quality as conformance to requirements (Güzel & Kurşunel, 2015). Kaoru Ishikawa implemented "quality circles" in 1962, in-

volving small voluntary groups responsible for investigating, solving, and reporting the root causes of workplace problems while emphasizing teamwork, manager-employee relationships, and volunteerism (Demirci, 2017). The quality concept began to take root in the 1960s with the "quality assurance" approach, evolving into "quality management" during the 1980s.

Higher education institutions, in addition to their primary mission of generating and disseminating scientific knowledge, have assumed responsibilities such as developing activities to meet employers' and students' expectations. Universities are expected to produce qualified graduates equipped with various skills to enhance their employment prospects during their educational journey (Özden, 2015). The competitive nature of the global world has prompted universities to recruit more successful students, employ high-potential faculty members, and foster diverse collaborations (Uslu et al., 2020). Studies on quality processes in higher education emphasize the necessity of cooperation and communication between higher education institutions, regional organizations, and stakeholders to enhance educational, research, and societal interaction activities (Dulupçu & Sungur, 2018). The role of leadership in promoting quality culture is another recurring theme in research. According to Chineze and Olele (2012), transformative quality is achieved through effective leadership that aligns institutional vision with service delivery. This concept is supported by Vaganova et al. (2020), who propose a model for managing educational activities that highlights collaborative efforts among stakeholders to meet educational needs. The integration of stakeholder perspectives, including students, educators, and employers, is critical for developing a holistic understanding of quality in higher education (Kinash et al., 2017). Moreover, the evolution of quality assessment methodologies to address contemporary challenges is strongly advocated in literature. Nenadál (2015) endorses the EFQM Excellence Model as a comprehensive tool for quality assessment, while Tanik and Şen (2023) emphasize the importance of aligning educational programs with the Bologna Process to enhance quality assurance. The integration of data-driven approaches, as discussed by Xiao-Bing (2018), highlights the need to leverage technology to improve quality monitoring and evaluation practices in higher education. Research on quality in higher education underscores the role of systematic approaches, stakeholder perspectives, and evolving methodologies in quality activities. Emphasizing institutional leadership, student participation in processes, and data-driven practices highlights the necessity of developing and disseminating good practices within a comprehensive and adaptable quality assurance framework capable of responding to the dynamic nature of higher education.

Quality processes in the context of higher education encompass a number of elements, including the personal qualities of graduates, the learning process, student feedback, self-assessment and peer assessment processes, and a multifaceted approach including students' teaching portfolios, the learning environment, learning processes, equity in education and student outcomes (Dicker et al., 2019; Leiber, 2019; Harrison et al., 2022; Sarrico, 2022; Özenç, 2024). In light of this, it is imperative that educational institutions adopt a holistic approach to improve the quality of teaching and learning (Barbato et al., 2022). Institutions are responsible for maintaining academic freedom, social contribution activities and institutional vision (Tight, 2020). However, a systematic review of both their theoretical research and practical applications in quality assurance activities will ensure quality (Eaton, 2021). In order to effectively attain quality assurance standards in higher education, institutions must ensure the sufficiency of their physical infrastructure, technological capacities, innovation potential, and human resources. Moreover, the continuous revision and enhancement of educational program curricula is imperative to meet evolving academic and societal demands (Asiyai, 2022).

1.2. Scope and Examples of Good Practices in Higher Education

Good practices in higher education encompass efforts to enhance the quality of education, improve student engagement, and create an environment conducive to learning. Research identifies key good practices such as technology integration, innovative teaching methods, faculty development, and the promotion of student engagement as critical components contributing to effective educational processes (Drummond et al., 1998; Fernandez et al., 2009; Chen & Yeager, 2011; Menon & Suresh, 2022; Aydoğdu, 2023).

One of the most significant aspects of good practices in higher education is the judicious use of technology to enhance learning experiences. Studies indicate that incorporating multimedia, educational games, and innovative pedagogical strategies can significantly influence self-directed and autonomous learning among students (Menon & Suresh, 2022). Furthermore, technology can facilitate collaborative peer learning, which enhances communication skills, critical thinking, and intrinsic motivation among students (Altınay-Gazi & Altınay-Aksal, 2017). Such integration not only enriches the learning environ-

ment but also prepares students for the demands of the modern workforce.

Faculty development is a cornerstone of good practices in higher education. Institutions that invest in the professional development of faculty members tend to witness improvements in teaching quality and student outcomes. Effective faculty development programs that focus on innovative teaching approaches and collaborative practices can enhance educators' confidence and competence (St-Amand et al., 2022). Moreover, fostering a culture of continuous improvement through regular feedback and evaluation of teaching practices is crucial for maintaining high educational standards (Chen & Yeager, 2011). This emphasis on faculty development benefits not only educators but also positively impacts students' learning experiences.

Assessment practices represent another critical area where good practices can be applied. The literature emphasizes the need for diverse and flexible assessment methods that cater to the evolving needs of students. Allowing students to choose the format of their assessments can increase their engagement and ownership of the learning process (Irwin & Hepplestone, 2012). Additionally, competency-based assessments are increasingly adopted to ensure that students acquire the necessary skills and knowledge relevant to their fields (Bergsmann et al., 2015). Promoting student engagement is another focal point of good practices in higher education. Student engagement and inclusivity are vital for creating a dynamic and responsive educational environment. Involving students in learning processes can lead to improved academic performance and satisfaction (Coates, 2005). Many researchers highlight the importance of active learning, collaboration, and responsiveness to student feedback as good practices in higher education. Institutions that prioritize student engagement often implement strategies that encourage participation and foster a sense of belonging among students, which is essential for their overall success. Overall, good practices in higher education not only enhance the quality of education but also contribute to the overall success and sustainability of higher education institutions.

2. Method

This study, which aims to reveal the good practices of the top-ranked universities in the Times Higher Education (THE) ranking in academic, social, and cultural fields, was conducted using qualitative research methods. Qualitative research methods enable the successful addressing of research problems in comprehensive and multidimensional study topics and facilitate the interpretation of original data. To obtain data, the study utilized the content analysis method, which can be used both qualitatively and quantitatively in studies systematically examining written documents (Krippendorff, 2004: 21-27; White & Marsh, 2006: 22 et al.). In content analysis, data obtained from various sources such as books, forum writings, emails, or websites are classified according to the research problem, and themes and conceptual categories are derived. Descriptive content analysis was preferred in the study. In this method, data related to a research topic are examined and organized, and general descriptive features and trends are revealed (Ültay et al., 2021: 190). Within the scope of the research, the websites, quality policies, and examples of good practices included on the websites of the top 50 universities in the Times Higher Education (THE) ranking in 2023 were examined. After classifying and organizing the obtained data, the categories on which the content focused were analyzed according to the European Commission's "European Education Area" focus topics (European Commission European Education Area, 2024) and the Higher Education Quality Council's criteria, including micro-credentials and online learning, equality, diversity and inclusion, sustainability, and community service. Relevant themes were explained with examples of good practices.

3. Findings

Table 1 presents data on the countries, regions, female-to-male ratios, and the average number of students per faculty member of the top 50 universities in THE 2023 ranking.

Table 1. Some Average Data of the Top 50 Universities in THE 2023 Ranking

Region and Countries	Universities in the Sample	Number of Universities	Number of Students per Faculty Member (Average)
Europe: Germany, Belgium, United Kingdom, Sweden, Switzerland	U1-U3A-U10-U11B-U22-U29-U30-U33U35-U37-U41-U42-U43-U47-U49	15	17.0
North America: USA, Canada	U2-U3B-U5-U6-U7-U8-U9-U11A-U13-U14-U15-U18-U20-U21-U23-U24-U25-U26A-U26B-U28-U32-U38-U40-U46-U48- U50	26	11.2

Asia: China, Japan, Hong Kong, Singapore	U16-U17-U19-U31-U36-U39-U45	7	14.9
Oceania: Australia	U34-U44	2	33.2

Source: THE World University Rankings 2023.

According to Table 1, it is observed that gender parity is largely maintained in Europe, North America, and Asia. When analyzed by region, the average number of students per faculty member is 11.2 in North America, 14.9 in Asia, 17.0 in Europe, and 33.2 in Oceania. These data suggest that North American institutions provide a more favorable student-to-faculty ratio compared to other regions, which may have implications for the quality of student-teacher interactions and academic support.

3.1.Micro-Credentials and Online Learning

Micro-credentials are the achievements acquired at the end of an assessment and evaluation process following a short course or training module (TYYÇ, 2024). Activities aimed at providing micro-credentials are mostly carried out through online or distance education methods, and certificates or digital diplomas can be awarded at the end of the course. Therefore, these activities are largely associated with digital platforms. The educational topics for micro-credentials that universities aim to provide to individuals are presented in Table 2. This section excludes online undergraduate and graduate programs, focusing solely on prominent educational topics offered by universities.

Table 2. Prominent Educational Topics in Micro-Credential Courses at Universities

Topics	Universities with Micro-Credential Courses	*f*	(%)
Data and Computer Science/ Mathematics	U1-U2-U3A-U3B-U5-U6-U7-U8-U10-U11B-U13-U14-U15-U16-U17-U18-U19-U20-U23-U24-U25-U26B-U28-U29-U32-U33-U34-U35-U36-U37-U38-U40-U41-U45-U47-U48-U49-U50	38	%76
Health and Medicine	U1-U2-U3B-U5-U6-U7-U8-U9-U10-U11A-U11B-U13-U14-U15-U16-U17-U19-U20-U21-U22-U23-U24-U25-U26A-U29-U31-U32-U33-U34-U35-U39-U40-U42-U44-U45-U46-U49	37	%74
Natural/Space/Engineering and Basic Sciences	U1-U2-U3A-U3B-U5-U6-U7-U11A-U11B-U14-U15-U16-U19-U20-U22-U23-U25-U26A-U28-U30-U31-U32-U33-U35-U36-U38-U39-U40-U41-U42-U43-U46	32	%64
Technology/Programming/Artificial Intelligence	U1-U2-U5-U7-U8-U10-U11B-U14-U15-U17-U20-U21-U22-U23-U24-U25-U26A-U26B-U28-U29-U30-U34-U36-U37-U38-U39-U40-U41-U42-U45-U50	31	%62
History/Art/Architecture/Design	U1-U2-U3A-U3B-U7-U8-U14-U15-U16-U17-U19-U21-U22-U23-U24-U25-U26A-U29-U31-U32-U33-U34-U35-U39-U40-U41-U42-U45-U47-U48	30	%60
Business and Management	U1-U2-U3B-U5-U7-U8-U9-U14-U15-U17-U18-U20-U21-U22-U23-U25-U26A-U29-U32-U33-U35-U36-U37-U40-U43-U45-U48-U50	28	%56
Environment/Energy Sustainability	U1-U2-U3A-U5-U8-U10-U11B-U15-U16-U17-U19-U20-U21-U22-U23-U24-U25-U29-U30-U32-U34-U39-U40-U41-U42-U47-U48	27	%54
Economy/Finance/Accounting	U1-U2-U3A-U5-U6-U10-U11B-U13-U14-U15-U16-U17-U18-U20-U21-U24-U25-U26A-U30-U31-U36-U37-U40-U47-U48-U50	26	%52
Cultural Studies/Languages/ Religions	U1-U2-U3A-U5-U9-U11B-U14-U15-U16-U17-U19-U21-U22-U23-U24-U26A-U26B-U29-U34-U35-U38-U42-U43-U45-U47	25	%50
Educational Science/Social Sciences	U1-U2-U3B-U8-U10-U14-U15-U16-U21-U22-U23-U25-U26A-U29-U31-U32-U34-U38-U39-U40-U46-U47-U48-U50	24	%48

Communication and Leadership	U1-U2-U5-U8-U11A-U13-U14-U15-U18-U19-U20-U22-U23-U24-U-26A-U26B-U30-U31-U34-U37-U38-U40-U48	23	%46
Law/Diplomacy/Politics	U1-U2-U7-U9-U11B-U14-U16-U19-U20-U21-U22-U24-U25-U26A-U29-U34-U35-U37-U39-U42	20	%40
Literature/Creative Writing/ Music	U1-U2-U8-U17-U19-U21-U24-U26A-U32-U33-U39-U40-U42-U45-U47	15	%30
Psychology and Counseling	U1-U2-U3A-U9-U16-U24-U35-U40-U42-U44-U45	11	%22
Philosophy	U1-U2-U5-U7-U16-U19-U26A-U42	8	%16
Equality, Diversity, and Inclusion	U2-U11B-U15-U20-U31-U37	6	%12
Critical and Analytical Thinking	U2-U3A-U5-U43-U44	5	%10

The selected universities carry out their online courses through certain distance education platforms, which include EdX, Coursera, Kadenze, Canvas, GetSmarter, Emeritus, ClassCentral, and FutureLearn. These platforms allow university stakeholders to effectively, efficiently, and systematically improve their micro-credentials. Moreover, many universities grant additional credits to students completing these courses, which are reflected on their transcripts.

A review of the educational topics offered by universities shows that data and computer science courses dominate with a 76% rate, followed by health and medicine (74%), natural sciences and engineering (64%), technology and artificial intelligence (62%), and art and design (60%). The provision of social science courses alongside technological and scientific topics highlights universities' commitment to enhancing 21st-century skills among their stakeholders. It is observed that universities offer online education programs aimed at enhancing the diverse knowledge and skills of their stakeholders, enabling them to address global challenges in a changing world and gain competence in digital transformation. Among these programs, courses in mathematics, data science, and computer science are the most frequently offered, accounting for 76% of the total. These are followed by health and medical courses, which make up 74% of the offers. This indicates a focus on addressing fundamental societal issues (e.g., vaccine development, nutrition, pandemics, patient care, etc.). Natural and space sciences, engineering, and basic sciences rank as the next most frequently offered courses, with a 64% share, while technology, programming, and artificial intelligence-related courses are provided by universities at a rate of 62%. These are followed by courses in history, art, architecture, and design (60%), business and management (56%), environment, sustainability, and energy (54%), and economics, finance, and accounting (52%).

An analysis of the courses offered by universities reveals that, alongside technology, economics, basic sciences, engineering, and sustainability, they also aim to equip their stakeholders with competencies in social sciences. In this regard, it is noteworthy that universities provide educational activities enabling stakeholders to gain cultural enrichment, with 50% of courses focusing on cultural studies, languages, and religions. The inclusion of topics such as educational and social sciences, communication and leadership, law, diplomacy and politics, literature, creative writing and music, psychology and counseling, philosophy, equality, diversity and inclusion, and critical and analytical thinking contributes to enhancing and developing students' competencies within the framework of 21st-century skills. The diversity of topics offered on online learning platforms is considered a good practice example for this category.

3.2. Sustainability

Within the scope of the research, it has been observed that the projects and studies conducted by universities primarily focus on environment, food/agriculture, and energy, often integrated with education and technology. Universities carry out these activities through relevant offices, coordination centers, or related units, adopting a multidisciplinary and collaborative approach. They have also established action plans and strategies, ensuring that these activities are open to stakeholder par-

ticipation, planned, systematic, measurable, and improvable. Among the sustainability initiatives in environment, food/agriculture, and energy, universities aim to achieve zero carbon emissions, reduce greenhouse gas emissions, design energy-efficient buildings, promote conscious water usage, encourage the use of public transportation, implement sustainable agriculture/food practices, and introduce award-winning applications in construction and other university operations.

Environment: Within the sustainability theme, environmental initiatives stand out. The following examples are provided:

U21: A water purification system using reverse osmosis and ultrafiltration has been developed to meet freshwater needs in impoverished countries and produce mineralized water from gray water on naval vessels. This system has also been implemented internally, reducing water and recycling costs.

U23: Goats are used for lawn maintenance on campus, providing organic fertilizer and eliminating the need for chemical fertilizers. A local wildflower garden has also been created to support pollinators such as bees and butterflies.

U32: A forest fire monitoring program has been launched in collaboration with three universities. Thermal cameras monitor forests in 12 regions, enabling immediate response to fires. Local communities are also informed and provided access to the monitoring map.

Food and agriculture: Another sub-theme within sustainability is food/agriculture practices. The following examples are highlighted:

U23: Students, academic staff, and administrative personnel jointly operate a farm in the university's botanical gardens. Students develop leadership skills, receive hands-on training, and gain volunteer and research opportunities. The farm also produces approximately $100,000 worth of food annually for campus dining halls.

U46: The university engages in agricultural activities to grow vegetables and fruits for student dormitories, retain financial resources within the institution, provide employment for students and technicians, and minimize its carbon footprint. This supports students' academic work, utilizes available land, and contributes to sustainability efforts.

Energy: Energy-related initiatives are another key aspect of sustainability. The following examples are provided:

U23: The campus features bicycle rental areas, and public transportation consists of hybrid buses running on 30% biodiesel fuel.

U34: In collaboration with the public sector, the university has implemented a "neighborhood batteries" project, creating an energy network using solar panels and energy-storing batteries for small businesses.

U41: The university meets 97% of its energy needs through hydroelectric power and 3% through photovoltaic energy, sourced from local electricity producers. LED lighting is used for all outdoor lighting, achieving a 55% reduction in energy consumption.

Education and technology: Within the sustainability theme, the education and technology sub-theme highlights stakeholder engagement and societal contribution. The following examples illustrate this:

U*11: The university gathers real-time feedback through an online platform on what actions should be taken regarding sustainability issues, incorporating these into its action plans. This is regarded as a good practice example of university-stakeholder collaboration.*

U30: The university utilizes student project and thesis outcomes to develop initiatives for villages in Africa facing energy, water, and food challenges. This enables villagers to improve agricultural practices, create employment, and generate income.

3.3. Equality, Diversity, and Inclusion

An examination of universities within this context reveals that coordination centers, offices, or commissions have been established to systematically implement equality, diversity, and inclusion activities. Below are some examples of good practices carried out by these units:

Individuals with special needs and disadvantaged groups: As a sub-theme of equality, diversity, and inclusion, the following example focuses on individuals with special needs or those from disadvantaged groups:

U50: A specially designed map has been created to facilitate campus accessibility for individuals with disabilities. Captioning options are available in digital environments for the hearing impaired, and specialized technological tools are provided for the visually impaired.

Education and project support: Another sub-theme of equality, diversity, and inclusion is education and project support. The following examples highlight this:

U3B: The university has launched a scholarship and employment program for doctoral students, providing financial and career support. It also offers mentorship, courses, and workshops. 77 percent of the students who benefited from this program are currently working as academics.

U7: Grants ranging from 1,000 TL to 10,000 TL are given to students who propose activities on the themes of equality and inclusivity chosen by the university. These events aim to explore complex social issues, examine how multiple aspects of identity influence interactions on and off campus, and provide opportunities to learn about others' experiences and perspectives.

U8: The university's Educational Opportunity Program provides low-income and underrepresented students with the guidance and resources necessary for success. These include academic and career counselling, access to basic needs, academic achievement awards, annual bicycle memberships for transportation, financial planning support, and a graduation gown lending initiative.

Combating discrimination based on race, language, religion, and gender: Another sub-theme of equality, diversity, and inclusion involves initiatives to combat discrimination based on race, language, religion, and gender. The following examples illustrate this:

U3B: The university's Center for Equity and Leadership hosts programs supporting Asian-American, Native American, and Black students, as well as a women's community program.

U11B: Students are permitted to miss classes or exams for religious holidays without academic penalty, provided they notify instructors at the beginning of the semester. Students and instructors can then arrange alternative times for missed coursework or exams.

U43: The university appoints an administrator to provide counselling to non-academic female staff with administrative roles, ensuring equal opportunities in career and education. This administrator also helps women balance work and family life, adjust working hours, and offers training on combating workplace harassment and ensuring job security.

Parenting, childcare, and elder care: Another sub-theme of equality, diversity, and inclusion focuses on parenting, childcare, and elder care. The following example highlights this:

U11: Recognizing that some students and staff may have young children, elderly or sick relatives to care for, or may be engaged in professional sports or dealing with serious illnesses, the university provides various forms of support. These include parental leave, insurance coverage, childcare assistance, and flexible working conditions. For employees aged 50 and above, the university offers mentorship programs addressing health, personal issues, legal and financial support, and retirement planning.

3.4. Community Service

Higher education institutions engage in activities that integrate individuals into society by instilling respect for societal norms, values, and culture, while also equipping them to adapt to changing global conditions, address global challenges, and acquire the knowledge and experience necessary to compete. These efforts contribute to societal development.

An examination of universities within the scope of this research reveals that community service processes are approached through research centers, various offices, and community engagement initiatives. Furthermore, activities in sustainability, equality, diversity, inclusion, and online education categories are largely associated with community service.

Health, social, cultural, and volunteering support: As a sub-theme of community service, initiatives focusing on health, social, cultural, and volunteering support have emerged. The following examples illustrate this:

U9: The university has established various collaborations outside its campus to promote learning and benefit society. Through these projects, students can conduct field research on a voluntary basis. For example, students in forestry programs are taken on tours of the country's forested areas. Public health program students collaborate with designated hospitals to research community and environmental health issues. Students in environmental studies travel to different countries to investigate air quality, urban transportation, and water-related issues. Similarly, international program students engage with ambassadors in their home countries to collaborate on economic and financial projects.

U31: A university research center identified a correlation between local media coverage of suicide incidents and subsequent suicide rates, prompting a campaign to discuss the media's pivotal role in influencing suicide rates. The campaign provides journalists with recommendations on their social responsibility and how to report such incidents more appropriately. Monitoring the campaign's outcomes revealed a reduction in regional suicide rates by over 30%.

U44: The university launched a program to combat the yellow fever mosquito, a threat to public health. As part of this initiative, a naturally occurring bacterium found in the eggs of certain environmentally and human-safe insects was introduced to infect yellow fever mosquitoes. This approach has significantly reduced the transmission of diseases such as yellow fever and dengue.

Education, project, and technology support: Another sub-theme of community service involves initiatives focused on education, project, and technology support. The following examples highlight this:

U3: The university has designed a mobile-based game to help young students improve their English skills. The application offers daily fun activities to develop the four language skills: reading, writing, listening, and speaking. Additionally, a mobile-based English learning set is available for adults seeking to enhance their English proficiency.

U3B: Four programs have been established to help students develop their knowledge and experience while contributing to society. These programs include full-time public service experiences that integrate academic learning with field practice; courses

in education, engineering, environment, health, and human rights; specialized programs integrating collaboration and leadership into public services; and opportunities to participate in post-graduation public institution scholarships, workshops, and activities.

U3B: The university's digital infrastructure and technology unit provides students with access to necessary software and digital design tools. This unit also offers support throughout the installation and technical training processes and provides computers to students who lack them.

U11: Through vocational training programs, the university prepares young people for professional and working life, contributing to the development of skilled personnel who meet the demands of the job market. Practical training is provided in 15 different professional fields, and successful graduates can apply for job postings at the university.

U14: A reward mechanism has been established to encourage student innovation and entrepreneurship. Final-year students whose technology-based commercial projects with societal and social impact are approved receive a $100,000 award and an annual salary.

4. Results and Discussion

This research, conducted to examine the good practices in quality assurance activities of universities ranked highly in the Times Higher Education rankings, reveals that these institutions have undertaken a wide range of initiatives to prepare their students, graduates, academic and administrative staff, and national and global citizens for new global conditions. These initiatives aim to equip individuals with new skills, enhance their talents, and foster adaptability. Universities have established coordination centers or offices to ensure the systematic implementation of their initiatives and activities, facilitate stakeholder engagement, and integrate feedback into their quality systems. Campaigns, events, programs, and community activities are planned, implemented, and shared with the public in collaboration with these units. In addition to science, technology, engineering, and mathematics (STEM), universities also focus on developing skills in social sciences, life sciences, arts, design, architecture, history, and culture.

Digitalization in higher education has made it easier for individuals of all age groups to participate in educational activities. This has led to changes in both the profile of learners and educational processes. Students from different age groups now expect high-quality, equitable services from universities, as they are more connected to social media, adept with technological tools, and actively engaged in career development (Fernandez et al., 2009; Taşkıran, 2017, et al.). Efforts towards digital transformation processes in higher education have a long historical background on a global scale. However, the Covid-19 pandemic has had a profound impact on higher education institutions worldwide and has led to a radical transformation of traditional education models. The extraordinary conditions created by the pandemic have left higher education institutions facing a serious test; in this context, the digitalization process has come to the fore as a critical element for the sustainability of education (Babaoğlu and Kulaç, 2021). Universities have made significant progress towards digitalization in an effort to integrate online and hybrid education models. The restrictions and social distancing requirements that emerged during the Covid-19 pandemic have resulted in the interruption of face-to-face education, making it necessary to rapidly strengthen digital infrastructures and make widespread use of online learning platforms. Educational institutions have begun to make intensive use of digital tools and distance education technologies in order to prevent disruptions in students' learning processes. In this context, the restructuring of digitalization strategies in higher education institutions has become essential, and it has been observed that the digital transformation processes, which were relatively slow in the previous period, have gained momentum. This challenging process has enabled digitalization to go beyond being just an alternative approach in higher education and become an integral and indispensable component of the system (Özek and Sincer, 2024). In this context, the universities in the sample have digitalized their educational processes to equip students, graduates, professionals, and the broader community with various competencies and skills. Video content, podcasts, mobile applications, games, and online education platforms are among the most frequently used digital tools. The flexibility offered by these tools has not only benefited students but also enabled professionals and the public to participate in educational activities.

Sustainability in higher education involves maintaining activities at local, regional, or global levels while minimizing problems related to the environment, nature, economy, society, and public health. This is achieved through education, research and development, and collaboration (Bergsmann et al., 2015; Bilgili & Topal, 2021; Aydoğdu, 2023, et al.). Menon and Suresh (2021), who conducted one of the most comprehensive studies on sustainability in higher education in recent times, identified ten factors that make sustainability in higher education possible. These are; integration of the curriculum with sustainability courses, pedagogical approach, skills and competencies of the instructor, collaborations, research, sustainability of leadership, media, organizational commitment, accreditation processes and government policies. Most of the universities examined implement various practices for many of these

factors. Universities have taken responsibility in this area and are encouraging their stakeholders to do the same. Research centers, programs, and institutes work alongside sustainability offices to address challenges both in their regions and globally, adopting a solution-oriented approach.

The creation of campus culture and the fight against global challenges have aligned higher education with the principle of inclusivity. Universities have recognized the diverse needs of their stakeholders and have developed learning environments that consider these differences. Factors such as race, language, religion, gender, and age, as well as educational background, family life, special circumstances, and financial resources, have been considered to foster an inclusive campus culture. Initiatives by the institutions in the sample are largely driven by the needs of students and society, with a focus on student-centered approaches, diversification of learning resources for qualified graduate competencies, and the establishment of national and international development goals in sustainability and community service. These efforts are closely linked to quality assurance processes in higher education.

In the context of the research, it can be stated that the findings related to micro-credentials in the selected universities are particularly associated with online learning activities. Universities conduct their online courses through distance education platforms such as EdX and Coursera. Among these courses, the highest proportion (76%) is in mathematics/data and computer science, while the lowest proportion (10%) is in critical and analytical thinking. Additionally, a wide variety of topics is offered across different fields such as education, social sciences, law, technology, medicine, engineering, and literature. Regarding sustainability, it is observed that universities focus more on areas such as environment, food/agriculture, and energy. Projects and studies in these areas include strategies that are open to stakeholder participation, systematic, and improvable. Coordination centers/offices have been established for equality, diversity, and inclusion activities. Various initiatives are in place for individuals with special needs and disadvantaged groups, while also addressing efforts to combat discrimination based on race, language, religion, and gender, as well as activities related to parenting, childcare, and elder care.

According to the Higher Education Quality Council (YÖKAK) Status Report (2023), similar initiatives are observed in Turkish higher education institutions. However, a key area for improvement is the lack of implementation of the Plan-Do-Check-Act (PDCA) cycle, particularly in community service activities. In this regard, it is essential for activities and events to be managed by dedicated units, offices, or centers to close the PDCA cycle effectively. Additionally, integrating processes with digital platforms can ensure successful planning, monitoring, and evaluation of quality assurance processes. Initiatives aimed at developing micro-credentials through distance education platforms and offering open-access courses to the public are known to contribute to both the quality of graduates and the development of an informed society. These efforts will enable systematic feedback collection for improving educational activities and achieving desired graduate competencies. In this context, it would be beneficial for higher education institutions in Turkey and other countries to identify regional, environmental, and national needs and incorporate them into their action plans. This can be achieved by creating more multidisciplinary working environments and workshops addressing global challenges, leveraging digital tools for global integration and competitiveness, and increasing online course offerings for micro-credentials. Future studies could explore other criteria recognized in higher education quality assurance, compare the outcomes of top-ranked universities in different ranking systems, and examine good practices of locally accredited universities at regional and national levels.

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Research Article

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"Corporate Governance" in Members of the Organization of Turkic States: Bibliometric Overview of Publications[1]

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Abstract

This study aims to analyze academic publications on corporate governance published in the member countries of the Organization of Turkic States (Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Hungary, Turkmenistan, Cyprus) between 2015 and 2024. Within the scope of the research, a total of 631 scientific publications in the "Web of Science" (WoS) database were reached; these publications were examined by descriptive analysis techniques according to years, countries, institutions and authors. In addition, current trends and basic research axes of academic production in the field of corporate governance were evaluated by bibliometric analysis method. In this context, co-authorship relationships, keyword associations and research themes were tried to be revealed by visualization-based analysis tools. This increase reveals that the importance of corporate governance in the Turkic world is increasing and that academic production in this field is spreading at a global level. While Turkey stands out as the country with the largest academic production in this field, countries such as Azerbaijan, Cyprus and Kazakhstan also make significant contributions. The vast majority of research is supported by higher education institutions and research centers, and the literature is shaped by a multidisciplinary approach. Keywords and researcher collaboration analyses show that production on corporate governance publications develops with an interdisciplinary perspective and a global network. The concept of "corporate governance" has a strong relationship with concepts such as "capital structure", "audit quality", "firm value", "agency theory" and "financial performance".

Keywords: Organization of Turkic States, Corporate Governance, Web of Science Databases, Bibliometric Analysis, Vosviewer.

JEL Codes: G30, M30, M40, M42, M48.

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1. Introduction

Corporate governance is a framework that determines how a company or institution will be managed, supervised and controlled. According to the Organization for Economic Co-operation and Development (OECD) (2015) , corporate governance provides certain principles and standards for companies to operate sustainably and respect the rights of all stakeholders. In the literature, corporate governance is defined as a management approach shaped by fundamental principles such as accountability, transparency, fairness and responsibility (Żak, 2019; Boța-Avram & Răchişan, 2013).

The importance of corporate governance is not limited to the internal functioning of companies; it also plays a critical role in ensuring economic stability, increasing investor confidence and supporting sustainable development. In this context, the corporate governance principles recommended by the OECD (2015) include elements such as strengthening the board structure, establishing independent audit mechanisms and protecting shareholder rights. These principles help businesses both improve their financial performance and strengthen their relationships with stakeholders (Salman & Nobanee, 2019; Lahlou, 2018).

Corporate governance also functions as a mechanism that ensures order between governments and the private sector. By encouraging companies to conduct their activities in an ethical and transparent manner, it supports economic growth and creates an environment of trust in markets. It also strengthens political stability, allowing the state to make its regulatory role more effective. Especially in developing countries, effective implementation of corporate governance can accelerate economic development and reduce risks such as corruption (Guthrie, K., & Sokolowsky, J. ,2010)

Adopting corporate governance practices contributes to companies and governments building a more robust economic and social structure. Factors such as increased investor confidence, reduced fraud risks, and increased management efficiency create a reliable environment in the business world, while also helping to ensure broader social and economic well-being (Ghabayen, 2012).

However, in order for the corporate governance standards determined by the OECD (2015) to be implemented with the same effectiveness in every country, local legal frameworks and cultural dynamics need to be taken into account. Governance models applied in developing countries are generally influenced by the standards of developed countries, but adapting these standards to local conditions is of great importance in establishing a successful governance system (Yoshikawa, T., Zhu, H., & Wang, P. 2014).

The necessity of adopting more harmonious industrial relations policies for sustainable economic growth and social stability in Organization of Turkic States countries, when the working life, union movements and employee-employer relations in these countries are analyzed comparatively, it shows that although industrial relations in Organization of Turkic States members have similar historical and cultural foundations, there are differences in practices. In addition, it is emphasized that it is important to increase regional cooperation for more effective functioning of labor markets and strengthening of social communication mechanisms. (Tiyek &Balcı, 2023) When governance indicators are examined in Azerbaijan, Kazakhstan, Kyrgyzstan and Türkiye, the founding countries of the Turkic Council, it is seen that good governance practices contribute to economic and social development and play a critical role in terms of economic growth, investment attraction and sustainable development. In addition, it has been determined that factors such as the rule of law, the fight against corruption and political stability are decisive in the development process. The Organization of Turkic States emphasizes that countries should strengthen their governance mechanisms in order to accelerate their national development. (Keser, et al. 2021).

Another important point emphasized in the literature is that corporate governance practices vary across countries. In a systematic review study conducted by Tezel and Günay (2023), it was explained that when corporate governance practices in different countries were examined between 2012 and 2022, these practices varied depending on factors such as culture, legal system and economic structure.

When the policies and practices of the members of the Organization of Turkic States towards their citizens living abroad are examined in comparison with the economic, social, cultural and legal support of the member countries, it is revealed that the policies of the Organization of Turkic States members towards their citizens living abroad are diverse, but a common strategy needs to be developed. In addition, it has been determined that institutional structures need to be improved and cooperation mechanisms need to be increased in order to strengthen ties with their countries (Tokmak &Kara , 2023).

There is a long-term relationship between governance at the country level and national development in these countries, including Azerbaijan, Kyrgyzstan, Kazakhstan and Turkey. It is clear that governance that is accountable, transparent, efficient, legal, and has a high level of political and administrative participation has a positive impact on national development. It is also a reality that foreign investors will prefer countries with a high level of governance (Keser et al. 2021).

The study aims to understand the development and trends of the scientific literature on how the concept of corporate governance is addressed in the member states of the Organization of Turkic States (Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Hungary, Turkmenistan, Cyprus). In this context, publications will be examined in terms of descriptive statistics by year, institution, country and author. In addition, visualizations created through the Vosviewer software will reveal the current trends and basic research axes of the academic literature in the field of corporate governance. The titles of research themes related to a group of corporate governance, co-authorship analysis of authors, co-occurrence of corporate governance and keywords will be included.

This study consists of theoretical background, method, findings and discussion titles, except for the introduction and conclusion sections. In the theoretical background, corporate governance theory, corporate governance models, corporate governance and cultural context relationship, internal control system and corporate governance relations, economical impacts and firm value impacts of corporate governance and gaps in literature are emphasized. In the method section of the study, bibliometric analysis method and Vosviewer software are emphasized. While the findings are presented to the attention of the reader in the form of tables and graphs, the meaning of the findings obtained is interpreted in the discussion section.

The research objectives of this article are as follows:

1. What is the distribution of academic articles on corporate governance published in the member countries of the Organization of Turkic States between 2015 and 2024 by year, country, and institution, and how does this distribution reflect the academic importance given to corporate governance?

2. What trends do research themes in the field of corporate governance show in terms of keyword synchronicity and subject clusters?

3. What structural patterns do collaborations among authors in the corporate governance literature exhibit, and around which countries and institutions do these collaborations focus?

2. Theoretical Background

In today's business world, companies need to have an effective corporate governance structure in order to achieve sustainable success and gain the trust of their stakeholders. Corporate governance is gaining importance as a framework that regulates the management structure, processes and relations with stakeholders of companies (Şengül & Kıral, 2023). It aims to create long-term value by ensuring that companies are managed in line with the principles of transparency, accountability, fairness and responsibility. Corporate governance is a fundamental management system for companies to continuously grow, gain competitive advantage, regulate their relations with their stakeholders and achieve long-term sustainable success (Żak, 2019; Boța-Avram & Răchişan, 2013).

The impact of corporate governance practices on firm performance has been addressed by studies conducted in various sectors in Türkiye. The contribution of corporate governance to financial performance in participation banks (Sarı & Güngör, 2020) and the importance of relations between the board of directors and stakeholders in the insurance sector (Başkan & Vardar, 2018) have been emphasized. Studies on the impact of corporate governance ratings on firm performance (Sönmez, 2023; Sakarya &Aksu, 2016) show that this relationship has been demonstrated quantitatively. In addition, the reflection of the relationship between audit quality and management practices on firm performance (Akçakanat &Aksoy, 2021) and the impact of compliance with transparency and accountability principles on profitability (Yaylalı, 2023) are noteworthy. These findings clearly reveal the decisive role of corporate governance on financial success.

When the literature in the Organization of Turkic States is examined in terms of corporate governance: In the case of Turkey, studies on the effects of corporate governance practices on the financial performance of companies show that independent boards of directors and transparency principles make a positive contribution (Ganda, 2022). Corporate governance compliance reports published by Borsa Istanbul allow systematic monitoring of the extent to which companies adhere to these principles (Borsa Istanbul). Studies conducted in Kazakhstan have shown that the structure of the board of directors is directly related to corporate social responsibility disclosures (Orazalin, 2019). The corporate governance structure in Kyrgyzstan has been evaluated by the European Bank for Reconstruction and Development in terms of legal framework and implementation deficiencies, and the need for reform has been emphasized (EBRD, 2022). In the analyses conducted in the context of Hungary, the risk of manipulation in financial statements in some companies was determined with the Beneish model, and it was stated that this situation was due to corporate governance deficiencies (Tarnóczi, 2023).Development partnerships carried out with the United Nations in Turkmenistan highlight the role of governance capacity in achieving sustainable development goals (United Nations in Turkmenistan. (2021). In Cyprus, the basic principles of corporate governance, namely management structure, shareholder rights and openness policies, are addressed in line with the current legal legislation, and it is aimed to regulate companies in this direction (Mondaq, 2021). The findings obtained from the studies carried out in these countries show that corporate governance is implemented with pra-

ctices that differ according to regional conditions and that there are areas open to development.

Corporate governance in Azerbaijan is undergoing a significant transformation process in terms of increasing managerial effectiveness, ensuring financial transparency and improving strategic decision-making processes. It is stated that corporate information systems contribute to the decision-making processes of enterprises and increase efficiency (Səlimova, C. M. 2021). While Amiraslanova, D. A. (2021) states that corporate governance principles strengthen the organizational structure with transparency and participation dimensions; Amiraslanova and Gurbanova (2022) emphasize that strategic planning and employee participation directly affect corporate performance Mustafayev, A. M. (2023). compared different corporate governance models in the banking system in Azerbaijan and revealed that effective risk and financial management practices are critical for the sustainability of the sector. In addition, Kərimli, V. B. O. (2020) argues that public-private sector harmony should be restructured in the context of economic security. In this context, the multidimensional structure of corporate governance practices clearly demonstrates the need for both structural reforms and strengthening the governance culture in Azerbaijan.

Corporate governance in Kazakhstan has become an important area of reform in terms of strengthening the institutional structure in both the public and private sectors and ensuring compliance with international standards. Qappar (2023) states that effective corporate governance in joint-stock companies in which the state participates should be restructured in line with the principles of transparency, responsibility and accountability. Mamyır, Madiyarova and Esakhmetova (2024) examine the evolution of corporate governance in Kazakhstan within the framework of global experiences and internal reforms and emphasize that systems based on international principles have been developed in the management of large public holdings. In terms of legal regulations, Begazova, Ömiräli and Omurchieva (2024) state that the legal framework of corporate governance has been shaped in a way that increases internal company efficiency and that decision-making mechanisms have been redefined according to this structure. In a previous theoretical framework. Zhunysova (2016) made evaluations regarding the integration of transparency, accountability, fairness and responsibility principles into institutional structures in Kazakhstan within the context of OECD principles. Drawing attention to the application of institutional governance principles in university management in the academic context, Altaibek et al. (2013) argue that these principles can also increase service quality and managerial effectiveness in the field of higher education. These comprehensive approaches show that Kazakhstan is undergoing a multidimensional and interdisciplinary transformation in the field of institutional governance.

Corporate governance is implemented with different models at the global level and is shaped according to the socio-economic structure of each country. Some studies conducted in Kyrgyzstan are as follows: Toktalieva and Kurmanbekov (2020) comparatively examined corporate governance models around the world and stated that their effectiveness is directly related to stakeholder participation and governance principles. Asanbaeva (2019a) stated that the democratization process in Kyrgyzstan strengthened the understanding of corporate governance; in another study (Asanbaeva, 2019b) explained the legal and ethical foundations of this structure in modern Kyrgyzstan. Omurchiyeva (2017) emphasized the importance of institutional legal regulations in terms of the investment environment and economic stability in the country; Sasıkulov and Askerbekova (2020) focused on the applicability of institutional systems in project management and their integration into the organizational structure.

Asset structure, managerial attitudes and accounting practices are among the basic elements that determine the effectiveness of corporate governance. In the study of Voszka (2000), it is emphasized that the ownership structure in Hungarian large industrial enterprises has a direct impact on corporate governance and that especially state-ownership rates determine the quality of governance. Benedek and Takácsné (2016) revealed that managerial attitudes focused on corporate social responsibility (CSR) in small and medium-sized enterprises (SMEs) are determinant in the development of responsible corporate governance understanding. Similarly, Perchi, Potoki and Batori (2024) state that positive off-balance sheet records in the accounting systems of enterprises play an important role in tax planning and management processes, and that this is critical in terms of transparency and risk management. Similarly, corporate governance studies in Cyprus have begun to take shape with reforms since the 2000s. While Stefou (2009) examined the governance reforms in Cyprus in comparison with Greece, Clarke (2008) drew attention to the structural difficulties in the implementation of governance principles in the country. The corporate governance codes published by the Cyprus Stock Exchange aim to increase transparency and accountability in companies (ECGI). In addition, new governance regulations developed after the 2013 economic crisis have brought about significant structural changes for state enterprises (ICAEW, 2024). The legislation in force in Cyprus is supported especially by the Companies Law and the Transparency Law (ICLG, 2024; Theocharidou, 2017).

There has been a significant increase in the number of studies on the concept of corporate governance in literature. Especially in recent years, topics such as the effects of corporate governance on company

performance, its applications in different sectors and differences by country have attracted the attention of researchers. In the study conducted by Tenteriz and Akkaya (2021), it is stated that a significant portion of corporate governance studies were conducted abroad between 2000-2021 and the number of studies published in this field in Türkiye has increased especially in the last three years. Studies on the effects of regional structures such as the Organization of Turkic States on corporate governance are limited. This study aims to contribute to academic literature by examining the relationship between regional governance and corporate governance.

3. Methodology

In this part of the study, the purpose, scope, research problems, data collection and analysis method are emphasized.

3.1. Purpose, Scope and Problems of The Research

This study aims to understand the distribution of academic articles on corporate governance published in the member countries of the Organization of Turkic States (Turkey, Azerbaijan, Kazakhstan, Kyrgyzstan, Hungary, Turkmenistan, Cyprus) between 2015 and 2024, by year, country and institution, and the academic importance given to corporate governance in this distribution. It also aims to determine the research themes in the field of corporate governance, the trends they show in terms of keyword synchronicity and subject clusters, how these themes differ across countries, and which countries the commonalities between authors are mostly concentrated between.

The development of corporate governance is an indispensable element of economic growth in terms of managerial responsibility, market controls and the growth of stock markets. (Mihail B. & Dumitrescu D, 2021) In this context, the development and trends of the scientific literature on how the concept of corporate governance is addressed in the member countries of the Organization of Turkic States were tried to be understood. The study was limited to the years 2015-2024. As a result of the literature review, it was noted that the articles on corporate governance were predominant after 2015 and that there was a lack of a bibliometric study of this nature covering the period. At the same time, this date range was found to be significant in terms of observing the impact of the corporate governance principles published by the OECD in 2015 on the publications made in the member countries of the Organization of Turkic States. This research both describes the general trends of the corporate governance literature in the geography of the Organization of Turkic States between 2015-2024 and analyzes how this concept is addressed within the framework of different disciplines and approaches. It is anticipated that the findings obtained will provide a holistic perspective to the concept of corporate governance and offer new perspectives for future research (Bal & Ufacık, 2024).

The scope of the research consists of 631 scientific literatures found in the "Web of Science" databases (https://www.webofscience.com/wos/woscc/basic-search). Data related to 631 scientific publications obtained by querying the database After the data cleaning stage, the data belonging to 631 publications analyzed with Excel and Vosviewer programs were analyzed with tables, graphs and maps and the findings were presented to the attention of the readers. Within the scope of the research, 631 scientific publications accessed in the "Web of Science" (WoS) database were examined with visualizations created by Vosviewer software: descriptive analysis techniques according to years, countries, institutions and authors. In addition, current trends and basic research axes of academic literature in the field of corporate governance were evaluated with the bibliometric analysis method. In this context, co-authorship relationships, keyword associations and research themes were tried to be revealed through visualization-based analysis tools.

3.2. Creation of Data Set and Analysis Method

The bibliometric analysis method was used in the study. Bibliometric analysis is a method that allows the quantitative evaluation of scientific publications in a specific field, period and region and the examination of the relationships between them (https://cabim.ulakbim.gov.tr, 03.07.2024). This method enables the analysis of scientific journals and other academic communication tools with mathematical and statistical techniques, aims to systematically classify publications and conduct a comprehensive review of academic literature (Ellegaard & Wallin, 2015; Tutar et al., 2023). This technique not only identifies academic intensity but also reveals the sectoral reflections of sustainability principles (Sevinç Başol et al., 2025). Bibliometric analysis reveals the general structure of a particular discipline by examining academic collaborations between countries, citation relationships between authors, the institutions to which the published studies belong and their distribution by year (Özbağ et al., 2019). In addition, it provides a retrospective view by evaluating the literary growth and academic contributions of a newly developing research field (Guleria & Kaur, 2021). The results of bibliometric analyses are usually presented with tables and mapping/visualization techniques, and especially visualization-based software plays an important role in cluster analysis (Beşel & Yardımcıoğlu, 2017; Donthu et al., 2021).

Data analysis of the data obtained from the WoS database was analyzed using the VOSviewer program. The VOSviewer program is a program that creates a visual map with the help of shapes and colors that associate bibliometric networks (Van Eck & Waltman, 2017). In this context, the analyses related to the relevant topic were carried out within the framework of various parameters. These are publication years, fields of publication and sources, distribution of publications and citations by year, most used keywords, most collaborating authors, countries, most cited authors and sources. In this context, the data collection process followed during the scan is shown in Figure 1.

Figure 1. Research Design.

In this study, Vosviewer software was preferred for bibliometric mapping and visualization purposes. Vosviewer enables visualization of collaborations between researchers and subject distributions of scientific studies by performing cluster analyses and co-occurrence analyses based on the citation relationships of scientific publications (Eck & Waltman, 2017; Ding & Yang, 2020). Vosviewer, which is an effective platform especially in the creation of bibliometric maps, is increasingly preferred in academic studies (Güney, & Ala,. 2024).). The dataset of the study was obtained from Web of Science (WoS), one of the most widely used academic databases worldwide. The query link for the dataset is as follows:

https://www.webofscience.com/wos/woscc/summary/f68cfb34-95b3-4fce-b117-43c388ab794f-014658893b/relevance/1

The relevant data set was created as a result of the query conducted on January 29, 2025. It is possible to present the limitations made during the data collection process in a comprehensive manner as follows:

Refine results for WC=(Business, Finance OR Business & Economics OR Business) and Business or Business Finance (Web of Science Categories) and 6.10.63 Corporate Governance (Citation Topics Micro) and 2024 or 2023 or 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 (Publication Years) and TURKEY or TURKIYE or AZERBAIJAN or KYRGYZSTAN or HUNGARY or UZBEKISTAN or CYPRUS or KAZAKHSTAN (Countries/Regions)

In the next part of the study, analysis findings are given.

4. Results

The results of the study are examined as descriptive findings and mapping (visualization) findings.

4.1. Descriptive Analysis

In the descriptive results section, the frequency of documents by year, documents by institution, documents by country and documents by authors are included.

4.1.1. Document by years (2014-2024)

The frequency of academic studies on corporate governance conducted by member states of the Organization of Turkic States between 2015-2024 shows significant changes over the years. Figure 2. shows the trend of academic studies on corporate governance conducted by members of the Organization of Turkic States between 2015-2024.

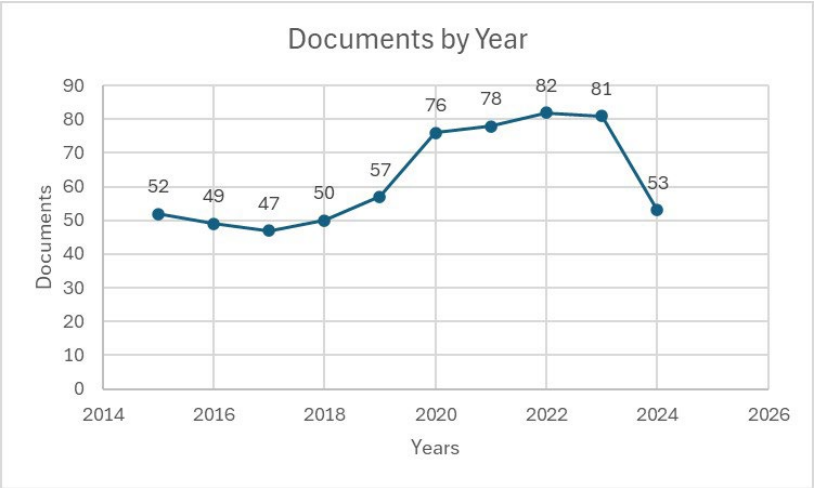

Figure 2. Documents by Year
Source: Web of Science Databases

As of 2024, 53 academic studies have a share of 8.48% in total. 81 (12.96%) and 82 (13.12%) studies were conducted in 2023 and 2022, respectively, and these were the years when the highest academic production was observed. While 78 academic studies conducted in 2021 correspond to a share of 12.48%, 2020 reached a significant production level with 76 (12.16%) studies despite being a pandemic year. While this number was 57 (9.12%) in 2019, 50 (8.00%) academic studies were conducted in 2018, 47 (7.52%) in 2017, 49 (7.84%) in 2016, and 52 (8.32%) in 2015. Over the years, academic production generally followed a fluctuating course until 2021, with a significant increase in 2022 and 2023.

4.1.2. Documents by affiliation (Top 10)

Figure 3. shows the distribution of academic studies on corporate governance conducted by member states of the Organization of Turkic States between 2015-2024 is shown by institutions. The 10 institutions that produced the most academic studies in the field of corporate governance by member states of the Organization of Turkic States are as follows: The Ministry of Education of the Republic of Azerbaijan has the highest share with 41 studies (6.56%), followed by the Cyprus University of Technology with 38 (6.08%) and Sabancı University with 36 (5.76%).

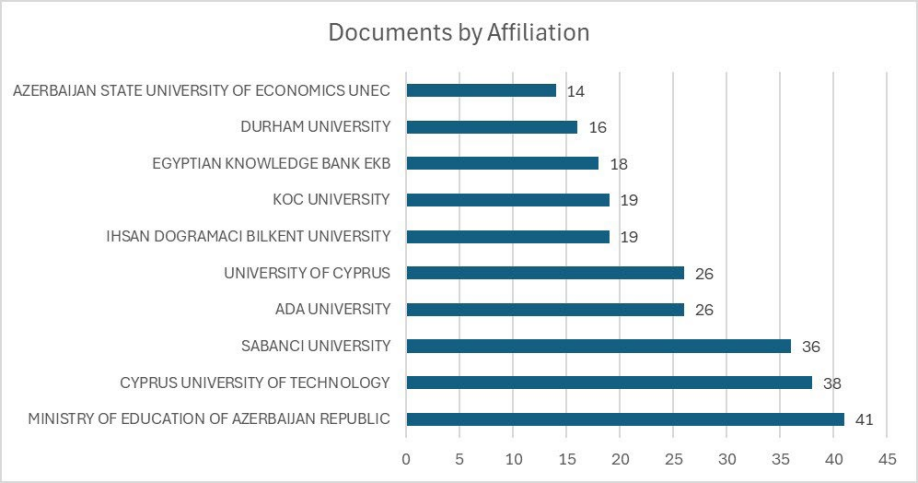

Figure 3. Documents by Affiliation
Source: Web of Science Database

In addition, ADA University and University of Cyprus also made a significant contribution with 26 studies (4.16%). İhsan Doğramacı Bilkent University and Koç University were included with 19 studies (3.04%) each, Egypt Knowledge Bank (EKB) was on the list with 18 studies (2.88%), Durham University was on the list with 16 studies (2.56%). Azerbaijan State University of Economics was in last place with 14 academic studies (2.24%).

4.1.3. Documents by countries

Figure 4. shows the distribution of academic studies on corporate governance conducted by members of the Organization of Turkic States between 2015 and 2024 by country.

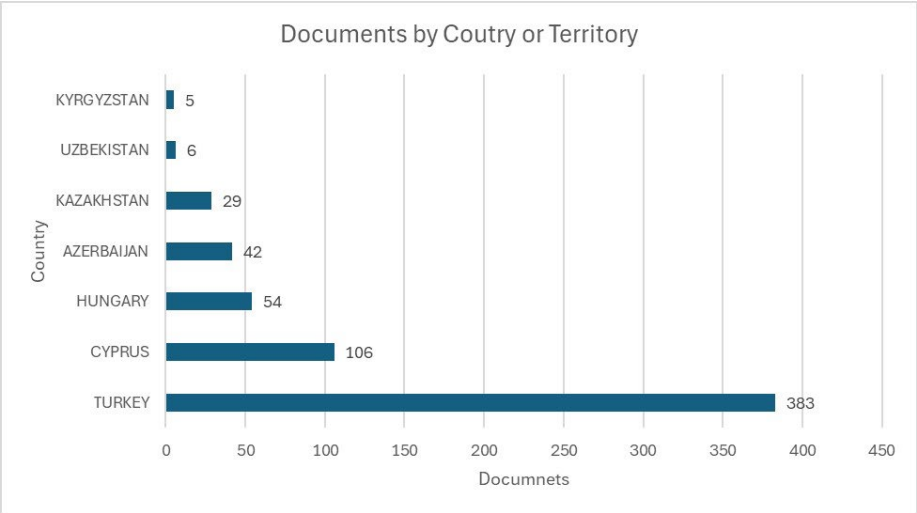

Figure 4. Documents by Country/Territory
Source: Web of Science Database

The distribution of academic studies on corporate governance conducted by members of the Organization of Turkic States is as follows: Turkey has the highest share with 383 studies (0.61%), followed by Cyprus with 106 studies (0.17%). Hungary ranks third with 54 studies (0.09%), followed by Azerbaijan with 42 studies (0.07%), Kazakhstan with 29 studies (0.05%). Uzbekistan has the lowest contribution with 6 studies (0.01%) and Kyrgyzstan with 5 studies (0.01%).

4.1.4. Documents by authors (Top 10)

Figure5. shows the distribution of academic studies on corporate governance conducted by members of the Organization of Turkic States between 2015 and 2024 by authors.

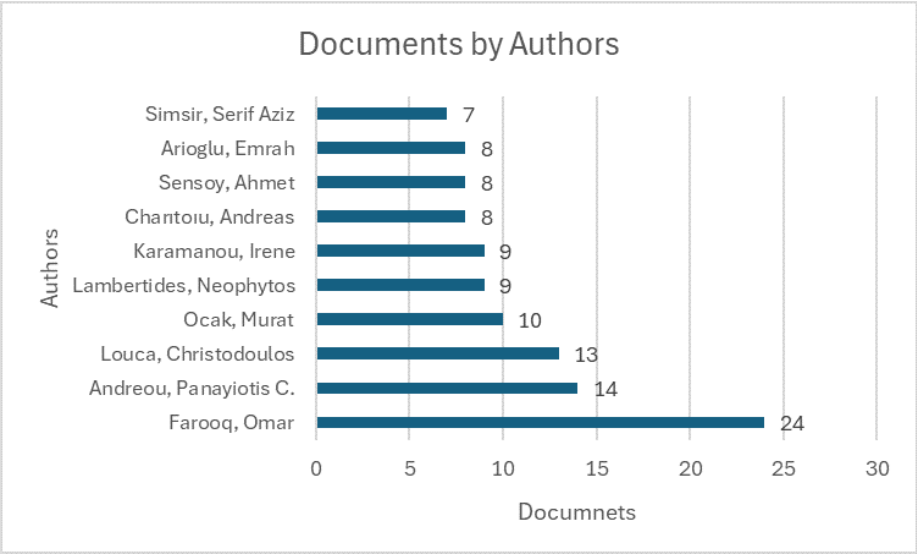

Figure 5. Documents by Authors
Source: Web of Science Database

The researchers who have contributed the most to the academic studies on corporate governance conducted by the members of the Organization of Turkic States are as follows: Omar Farooq is the researcher who has produced the most academic production with 24 studies (3.84%). Panayiotis C. Andreou follows him with 14 studies (2.24%). Christodoulos Louca is in third place with 13 studies (2.08%), and Murat Ocak is in fourth place with 10 studies (1.60%). Other important researchers include Neophytos Lambertides and Irene Karamanou with 9 studies (1.44%) each, while Andreas Charitoiu, Ahmet Sensoy, Emrah Arıoğlu and Şerif Aziz Simsir have contributed with 8 studies (1.28%) each.

4.2. Mapping and Visualization of Bibliometric Data

Bibliometric analysis is an important method for understanding the development of a specific research area in academic literature, evaluating collaboration between researchers, and examining scientific clusters around specific topics. In this context, visualizations created through Vosviewer software reveal the current trends and basic research axes of academic literature in the field of corporate governance. In this context, the following three basic types of analysis will be discussed in detail.

4.2.1. Research themes related to group of corporate governance

Figure 6. presents a network visualization created using Vosviewer software to reveal the conceptual relationships of the corporate governance topic in the academic literature of the Organization of Turkic States.

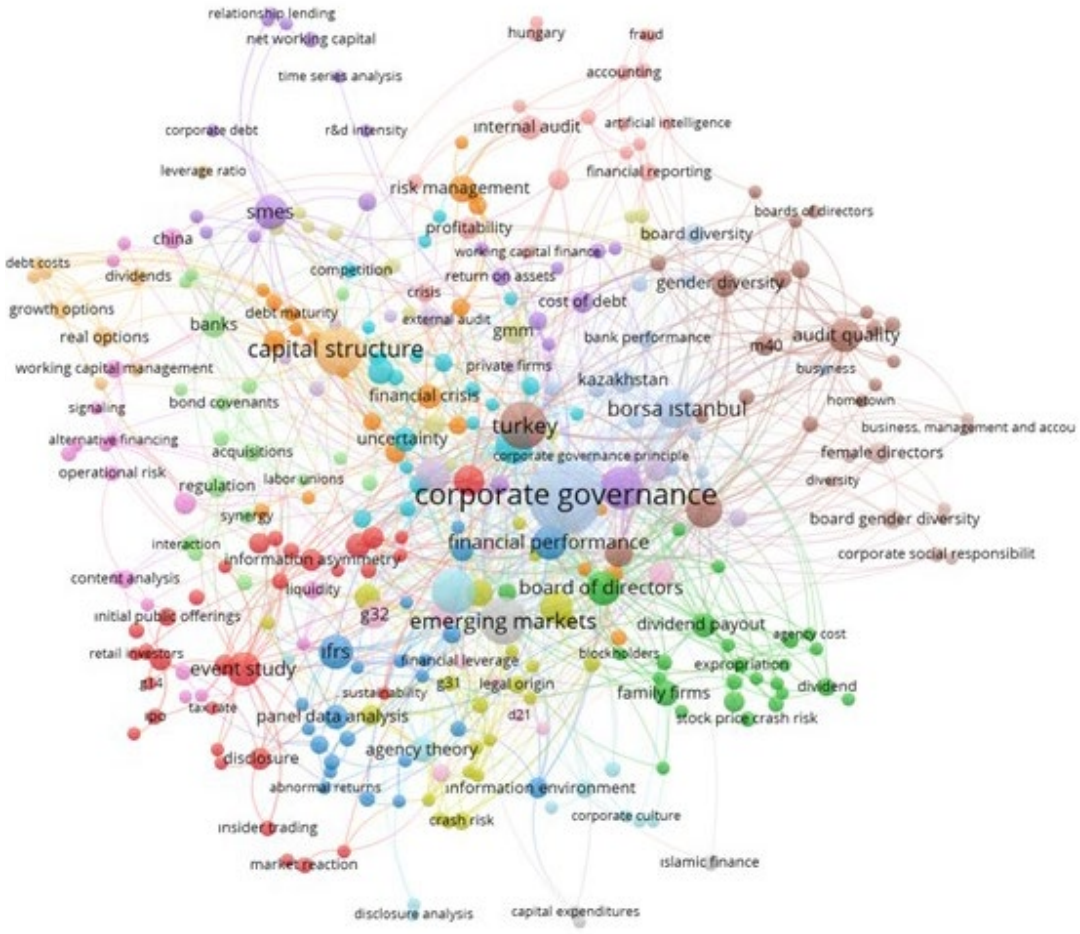

Figure 6. Network Visualization of Corporate Governance
Source: Web of Science Database

The concept of "Corporate Governance" at the center of the map emphasizes the centrality of the subject in the literature and is closely related to concepts such as "Financial Performance", "Board of Directors" and "Emerging Markets". The visualization includes clusters representing different dimensions of corporate governance. For example, issues such as capital structure, debt management and financial crises are addressed within the framework of capital markets and financial stability, while elements such as gender diversity, board independence and audit quality are examined from the perspective of governance mechanisms and corporate sustainability. Furthermore, issues such as information asymmetry, event studies and insider trading are linked to market efficiency and regulatory oversight processes

in the context of financial markets. Concepts such as "Turkey" and "Borsa Istanbul" on the map show that corporate governance is also addressed at the regional level and reveal that financial governance practices in Turkey are taken into consideration in the academic literature in the context of emerging markets.

4.2.2. Co-authorship analysis of authors

Figure 7. shows a visualization of a co-authorship network created using Vosviewer software to analyze academic collaboration networks. The visual reveals the relationships between authors who work together on academic publications, allowing analysis of specific research groups, density of collaboration networks, and interactions in literature.

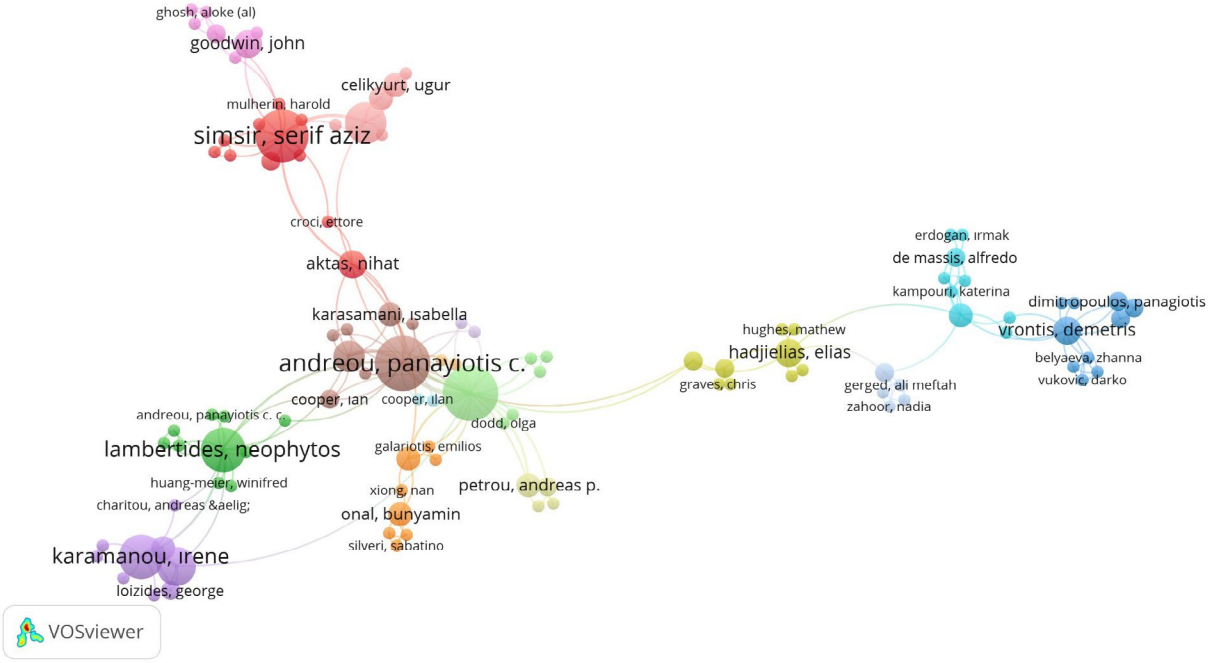

Figure 7. Co-Authorship of Authors
Source: Web of Science Database

Authors such as "Andreou, Panayiotis C." and "Simsir, Serif Aziz" located in the center of the map have a wide academic collaboration network and make important contributions to the literature by establishing connections with different research groups. In addition, researchers such as "Vrontis, Demetris" and "Dimitropoulos, Panagiotis" located on the right side of the map have a strong collaboration structure.

The visual shows different clusters, which indicate that authors are organized around specific academic disciplines or fields of study. The red cluster consists of academics focusing on finance and accounting, while the green cluster indicates larger-scale collaborations in the financial management and accounting disciplines. The blue cluster brings together authors specializing in business management and strategic management, while the yellow cluster has a smaller-scale collaboration network. The density of connections in the network reveals the influence of specific authors in the field and the structure of academic relationships.

4.2.3. Co-occurrence of corporate governance keywords

Figure 8. was created using Vosviewer software to analyze co-occurrence relationships between keywords used in corporate governance literature. The visual visualizes the connections and densities between the basic concepts related to corporate governance, revealing the main research topics in the field and trends in academic literature.

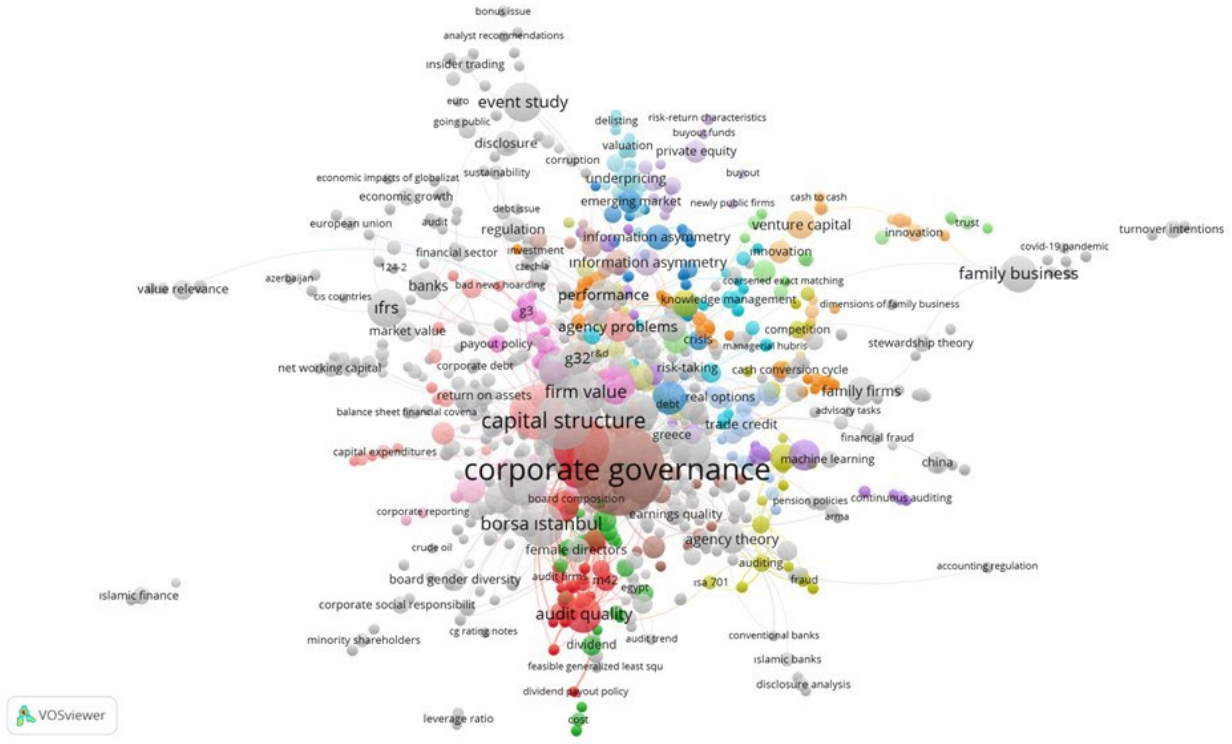

Figure 8. Co-Occurrence of Keywords
Source: Web of Science Database

The concept of "corporate governance", located in the center of the map, has a wide research framework and has a strong relationship with concepts such as "capital structure," "audit quality," "firm value," "agency theory" and "financial performance." This situation shows that corporate governance is in close interaction with critical issues such as financial structure, audit quality and firm value. In addition, it is observed that themes such as "family business," "venture capital" and "innovation" are clearly clustered, and it is understood that these concepts are the subject of increasing academic interest within the framework of corporate governance.

The different clusters in the image reflect interdisciplinary connections in the corporate governance literature, indicating different research orientations in subfields such as auditing, finance, investment, ethics and sustainability. The connection densities in the map help to determine the direction of academic work in these areas and possible research gaps by revealing the extent to which certain topics are interrelated.

5. Discussion

The increasing importance of corporate governance necessitates the adoption of sustainable practices and offers multidimensional contributions such as strengthening the investment environment in developing countries, reducing corruption risks, supporting sustainable economic growth and increasing international investor confidence. OECD (2015) For this purpose: Bibliometric Analysis of the Studies on "Corporate Governance" of the Organization of Turkic States Member States, the aim is to examine the changes observed in the corporate governance literature in member states from various perspectives. An attempt was made to examine the research conducted in the member countries of the Organization of Turkic States in the field of corporate governance using bibliometric analysis methods and visual mapping techniques. The most influential articles, authors, countries and institutions in this field were determined using the WOS database. In this study, Vosviewer software was preferred for bibliometric mapping and visualization purposes.

The research findings show that studies on corporate governance have increased significantly in general after 2020 and are especially concentrated in countries such as Turkey, Cyprus and Hungary. The universities with the most publications include "Mınıstry Of Education Of Azerbaijan", "Cyprus University Of" and "Sabancı University". In addition, the most frequently used keywords in the literature are the concept of "corporate governance", which has a wide research framework and concepts such as "capital structure", "audit quality", "firm value", "agency theory" and "financial performance" stand out. The research themes are the concept of "corporate governance", although the subject is the basis in the literature, publications have been made in concepts such as "Financial Performance", "Board of Directors" and "Emerging Markets". This situation shows that corporate governance has been investi-

gated in detail in the Organization of Turkic States. The necessity of increasing auditing for the effective implementation of corporate governance and the strengthening of the capital structure show that corporate governance mechanisms will improve the financial performance of publicly held companies. (Chalabi, 2023). The relationship between corporate governance and firm value shows that corporate social responsibility is a factor that strengthens this relationship and increases value for firms with good corporate governance but can only be used as a marketing tool for poorly managed firms. In order for corporate social responsibility to contribute to firm value, it must be supported by an effective corporate governance framework (Jo & Harjoto., 2011).

In the findings; it was seen that agency theory was addressed. Corporate governance theory has been shaped on the basis of different scientific approaches. These are as follows: The Agency Theory argues that companies should strengthen their accountability mechanisms by addressing conflicts of interest between shareholders (principal) and managers (agent) (Jensen & Meckling, 1976). Stakeholder Theory emphasizes that not only shareholders but also all stakeholders related to the company should be taken into consideration (Freeman, 1984). Resource Dependence Theory states that companies cannot be independent of environmental and economic conditions and that these factors shape management mechanisms (Pfeffer & Salancik, 1978). These theoretical frameworks provide a critical foundation for understanding how corporate governance systems affect the performance of companies and it has been determined that other theories have not been examined much in terms of keywords in the countries under study.

In the study, it is seen that co-authors are organized around specific academic disciplines or fields of study. The authors who conduct research in the field of corporate governance are mostly academics who focus on finance and accounting, indicating larger-scale collaborations in management and accounting disciplines. Authors who specialize in business management and strategic management also have collaboration networks in this field. The analysis of co-authorship of authors is an important opportunity to understand the scope of collaborations in academic literature and to examine interdisciplinary interactions. Because corporate governance practices vary depending on cultural differences (Hofstede, 2011) .It has been determined that the norms embedded in the culture of societies affect the management structure of institutions at the board level (Li & Harrison, 2008).

Corporate governance plays a key role in ensuring sustainable economic growth and increasing international investor confidence. The principles of corporate governance defined by the OECD (2015) aim to improve both the internal structures of businesses and their stakeholder relations in line with values such as transparency, accountability, justice and responsibility. The implementation of these principles in developing countries increases the reliability of the investment environment, reduces corruption risks and strengthens the stability of capital markets (Guthrie & Sokolowsky, 2010; Ghabayen, 2012). The findings of this study show that there has been a significant increase in academic production on corporate governance in the member countries of the Organization of Turkic States in the period 2015-2024. The publications, which are especially concentrated in countries such as Turkey, Azerbaijan and Cyprus, reveal that the subject of corporate governance is of increasing importance in this geography. Visualization analyses performed with Vosviewer showed that the concept of "corporate governance" is mentioned in the literature together with themes such as "financial performance", "firm value", "capital structure", "audit quality" and "agency theory".

In addition, the effects of managerial components such as board structure, effectiveness of independent members, and diversity on firm performance have been discussed in detail in this literature. For example, in their study on Borsa Istanbul firms, Özer, Yalçın, and Yıldız (2023) found that the board structure had a significant moderator effect on firm value. Düzer (2020) evaluated the relationship between corporate governance and sustainability in environmental, social, and economic dimensions and revealed that these practices positively contributed to the efficiency of firms. Regarding financial reporting quality, Akgün (2018) stated that Turkish Financial Reporting Standards (TFRS) increased the transparency level of companies. Similarly, Akçakanat and Aksoy (2021) emphasized that audit committee activities had a positive effect on firm profitability. The importance of diversity in boards of directors was associated with gender balance and risk perception of independent members by Otluoğlu (2016); Topaloğlu and Ege (2019).

In addition, although there are similarities between corporate governance practices in the member countries of the Organization of Turkic States, there are also various differences originating from institutional, legal and cultural differences. For example, it is seen that structures based on international governance principles have been developed in public companies in Kazakhstan (Qappar, 2023), while corporate information systems and transparency are emphasized in Azerbaijan (Mustafayev, A. M. (2023). In countries such as Kyrgyzstan, Hungary and Turkmenistan, the need for governance reforms and strengthening of independent audit structures is expressed (Tarnóczi, 2023; IMF, 2024).

Within the scope of bibliometric analysis, co-aut-

horships and academic collaboration networks were also examined; it was seen that academic production was concentrated in the fields of finance, accounting, strategic management and business administration. When the documents were examined according to the authors, it was determined that authors such as Omar Farooq, Panayiotis C. Andreou, Christodoulos Louca and Murat Ocak made significant contributions to the corporate governance literature. Interaction networks between authors support the interdisciplinary nature of corporate governance and the potential for global academic collaboration (Guney & Ala, 2024). These analyses also reveal that Turkey is a leader among the countries of the Organization of Turkic States not only in terms of the number of publications but also in terms of the structural flow of information in the literature.

As a result, this study presents the themes, actors and structural dynamics of the literature on corporate governance in the member countries of the Organization of Turkic States in a holistic manner. This academic trend, which encourages cooperation among the countries of the Organization of Turkic States and supports governance reforms, is important in terms of guiding regional development strategies. Although the interdisciplinary structure of the concept of corporate governance varies according to the economic, legal and cultural contexts of the countries, it unites around the goal of holistic and sustainable development. In this context, it is thought that the findings obtained from the research will not only contribute to the existing literature, but also provide strategic guidance for policy makers, regulatory institutions and academic circles.

6. Conclusion

This study, which aims to understand the development and trends of the scientific literature on how the concept of corporate governance is addressed in the members of the Organization of Turkic States, has shown that the scientific literature has increased significantly in the period after 2021. This increase reveals that corporate governance has gained importance in the Turkic world and that academic production in this field has spread on a global scale. While Turkey stands out as the country with the largest academic production in this field, countries such as Azerbaijan, Cyprus, and Kazakhstan also make significant contributions. In addition, it is observed that a large part of the studies on corporate governance are supported by higher education institutions and research centers, and that the literature in this field is developed with a multidisciplinary approach. Analyses on keywords and researcher collaborations show that academic production in this field is increasingly shaped by an interdisciplinary perspective and a global network. The concept of "corporate governance" has a wide research framework and has been found to have a strong relationship with concepts such as "capital structure," "audit quality," "firm value," "agency theory" and "financial performance." This situation shows that corporate governance is in close interaction with critical issues such as financial structure, audit quality and firm value. In addition, it is observed that themes such as "family business," "venture capital" and "innovation" are clearly clustered, and it is understood that these concepts are the subject of increasing academic interest within the framework of corporate governance.

This research contributes to the theory by examining how the corporate governance forms of the Turkish member countries are addressed and the development conditions of the recorded literature in this field.In practice, this research provides an important reference in terms of policy development and increasing academic collaborations aimed at strengthening corporate governance practices among the members of the Organization of Turkic States. It enriches corporate governance practice both locally and glob ally by revealing potential new areas and research opportunities in the academic world and inter-institutional collaborations.

The limitations of this research stem from the limited database used and the determined keywords. The query was conducted using the "Corporate Governance" Citation Topics Micro in the Web of Science database and only within the categories of "Business", "Finance", "Business & Economics". In addition, a data set limited to only the full member states of the Organization of Turkic States (Turkey, Azerbaijan, Kyrgyzstan, Hungary, Uzbekistan, Cyprus, Kazakhstan) was used. The fact that the publication years were focused on the period between 2015-2024 ignores important academic studies conducted in previous years. These limitations may create difficulties in evaluating a broader perspective and global trends on corporate governance. In addition, the limited analysis with only certain keywords may cause other potential concepts and literature related to the subject to be overlooked.

The direction of the corporate governance trend in the members of the Organization of Turkic States, the concepts that need to be worked on, why the states that produce less publications produce less literature, cultural differences, democratic development, etc. are research problems for researchers interested in the subject.

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The Relationship Between Motivation and Organizational Commitment: A Meta-Analytic Review[1]

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Abstract

This study employed a meta-analytic approach to explore the impact of motivation on organizational commitment. Meta-analysis is a structured synthesis technique used to aggregate and analyze the results of multiple quantitative studies conducted across different time periods and contexts, providing a comprehensive estimate of the overall effect size. For this research, a systematic literature search was carried out using Google Scholar and ProQuest databases, with the keywords "job motivation" and "organizational commitment." The initial search yielded 609 studies published between 2020 and 2025. After a detailed screening process, 20 studies that directly examined the relationship between motivation and organizational commitment were selected. These studies collectively involved a total of 6,790 participants, and were included in the final meta-analysis.

The Q and I^2 test results indicated a high level of variance (heterogeneity) among the studies analyzed ($Q = 402.197$, $I^2 = 95.276$). Therefore, a random effects model was employed to conduct the meta-analysis. According to the findings, a positive and significant relationship was found between organizational silence and burnout ($r = 0.584$, $p < 0.05$). Analyses conducted using Fisher's Z transformation showed that the confidence intervals supported this relationship. To assess publication bias, various methods were utilized, including Egger's test, Duval and Tweedie's trim-and-fill test, and Begg and Mazumdar's rank correlation test. These analyses indicated no significant publication bias. Funnel plot analyses also demonstrated a low risk of bias.

Keywords: Motivation, Organizational Commitment, Meta Analysis.

JEL Codes: D23

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1. Introduction

Motivation is defined as the outcome of the direction, intensity, and persistence of the internal drive that leads an employee toward a particular behavior. Motivation is considered a key driving factor in both employees' individual competencies and their job performance. In this regard, motivation is frequently examined in the relevant literature within the context of organizational psychology and organizational behavior, and in relation to various constructs such as organizational citizenship (Kanwal & Tariq, 2016), job satisfaction (Anwar & Shukur, 2015; Tella et al., 2007), and organizational commitment (Meyer et al., 2002; Bytyqi, 2020). Accordingly, the dynamics of the relationship between motivating forces (motivators) and the outcomes of such behavior (organizational commitment) shape both the scope of studies in the field and the theoretical frameworks on which they are based (Rhoades & Eisenberger, 2002; Whitener, 2001; Wayne et al., 2002).

The link between motivation and organizational commitment is frequently examined within the theoretical frameworks of Social Exchange Theory and Self-Determination Theory (SDT). Defined by Deci (1971), Self-Determination Theory focuses on the influence of intrinsic and extrinsic motivational factors on individual behavior. This theory examines the factors that lead to either motivation or lack thereof, and how these factors affect behavior, distinguishing between those driven by intrinsic satisfaction and those prompted by external outcomes (Deci & Ryan, 1985). When employees are amotivated, they do not perceive any valid reason to engage in behavior. In other words, they do not find sufficient value in the reasons that would otherwise lead them to act, and therefore, they are not adequately motivated to exert effort (Van den Broeck et al., 2021; Green-Demers et al., 2008).

While Self-Determination Theory (SDT) draws attention to the underlying psychological needs and behaviors that facilitate motivation, Social Exchange Theory emphasizes the role of expectations and reciprocal benefits in driving actions. Thus, SDT highlights the internal mechanisms of motivation, whereas Social Exchange Theory focuses on the external, relational dynamics that influence employee engagement and commitment.

In defining the intersection between motivation and organizational commitment, the significance of Social Exchange Theory (SET) is frequently emphasized within the conceptual framework. Originally conceptualized by Homans (1958), Social Exchange Theory was later expanded by Blau (1964), who linked it to the concepts of exchange and power. According to Blau (1964), social exchange is defined as the authority of one party to influence the actions of the other through rewarding responses. In this context, individuals are voluntarily motivated to act based on the anticipated rewards they expect to receive as a result of their actions. While SET posits that an exchange must be initiated by one actor, it also recognizes that individuals may trigger passive forms of behavioral change internally, even without external stimuli, especially in reaction to negative emotions (Ahmad et al., 2023).

Social Exchange Theory emphasizes that employees' contributions to the organization are shaped by their perception that employers value their efforts and are genuinely concerned with improving their well-being. (e.g., Rhoades & Eisenberger, 2002; Whitener, 2001; Wayne et al., 2002). In this context, placing humanistic practices at the forefront within organizations not only facilitates the redefinition of organizations as entities with human-like characteristics in terms of organic relationships, but also leads to a shift in perceptions among employers, organizations, and employees. This shift may enhance employees' perception of organizational support (Darolia et al., 2024, p. 70). Moreover, Social Exchange Theory offers insights into employee engagement, motivation, and the intention to remain within the organization. It specifically explains how motivation-related factors—such as employee involvement, rewards, job security, and empowerment—function within organizational settings (Gould-Williams & Davies, 2005). According to Social Exchange Theory, various outcomes may arise based on employees' psychological expectations, such as burnout, organizational citizenship behavior, task performance, etc. (Yin, 2018). Consequently, it is crucial to revisit the link between motivation and organizational commitment to gain a deeper understanding of how these concepts interact.

2. Conceptual Framework

Motivation is defined as a conscious reason that transforms into a driving force for action. This motivation may or may not trigger an action that contributes to the achievement of the organization's goals (Andreas, 2022). Motivation is seen as a concept related to the fulfillment of employees' needs, their perceptions of the goal-setting process, and their expectations of rewards for their efforts. Organizations can strengthen employees' organizational commitment by enhancing motivation related to achievement and self-actualization. Furthermore, providing feedback and the nature of the job also play a crucial role in increasing employee motivation (Darolia et al., 2024).

The nature of the job, the relationships among individuals in the work environment, employees' needs, organizational climate, rewards, and employee policies are factors that influence employee motivation (Darolia et al., 2024). Motivation, defined as the decision-making process, is described as the behavior aimed at achieving a goal (Hemakumara, 2020).

The motivation process typically begins when an individual recognizes an unmet need. A goal is set to address this need, and the need is subsequently fulfilled. Rewards and incentives can motivate employees. Additionally, motivation levels are also influenced by the social context (Anwar & Shukur, 2015).

Organizations focus on motivating human resources, which are difficult to imitate, in order to survive and remain competitive in a dynamic environment. In this context, it is essential to predict the types of motivation within organizations and the behaviors associated with them (Figure 1).

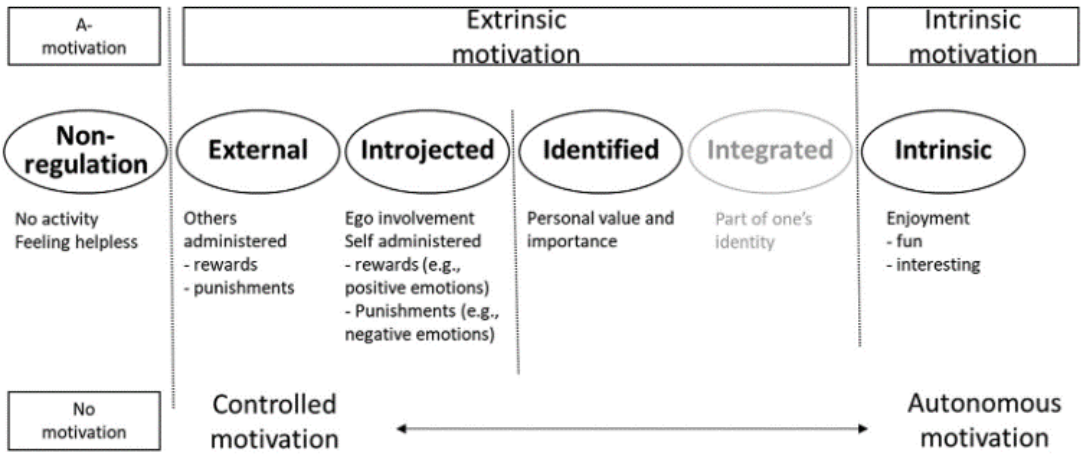

Figure 1. Types of Motivation's Impact on Employee Behavior
Source: Van den Broeck etc.,2021

Figure 1 illustrates the types of motivation that influence employee behavior. Motivation is a process that includes both intrinsic and extrinsic regulations, as well as the absence of motivation itself. Intrinsic motivation involves introjection, which refers to an internal pressure. Introjection can lead to both positive and negative outcomes. However, Van den Broeck (2021) emphasizes that external regulations may have a negative impact on well-being, with limited interaction in terms of employee behavior. It is also stated that amotivation, defined as a lack of motivation, triggers negative outcomes. When employees perform a task to either receive a reward or avoid punishment, external regulation has been enacted. Examples of external conditions include receiving a bonus, the risk of being fired, or avoiding social criticism (Gagné et al., 2015).

Intrinsic motivation occurs when employees are self-motivated by fulfilling their personal needs. Employees tend to engage in tasks they believe will help them meet these needs. They are intrinsically motivated by jobs that align with their personal goals and offer characteristics such as responsibility, autonomy, opportunities for skill development, and engaging or meaningful tasks (Ali & Anwar, 2021). When employees are intrinsically motivated, they adopt work activities as goals in themselves. As a result, activities and goals become mutually reinforcing. This alignment enhances job satisfaction, as employees experience a greater sense of fulfillment when their activities and goals are in harmony (Fishbach & Woolley, 2022).

Intrinsic motivation has been found to influence organizational commitment (Mohsan et al., 2010). Employees with high levels of intrinsic motivation tend to experience greater job satisfaction and demonstrate better job performance. However, these outcomes may also result from external factors (Schulze & Steyn, 2003). Extrinsic motivation is defined as the desire to fulfill needs and wants that are not directly related to the work itself (Salleh et al., 2016). It occurs when external agents make an effort to motivate the individual. In extrinsic motivation, behavior is driven by the reward management system, and is often triggered by salary, praise, or promotion (Ali & Anwar, 2021).

Organizations recognize that when they ensure employee productivity, responsiveness, efficiency, and a sense of being appreciated, job satisfaction is likely to increase (Ali & Anwar, 2021). High levels of employee motivation lead to greater productivity, encouraging employees to work more efficiently and effectively. When motivation is high, employees are expected to demonstrate higher performance, which naturally results in greater rewards. Motivation enables employees to focus on their tasks, helping them identify opportunities for workplace improvement and creating a sense of responsibility for self-development (Rachman, 2022).

3. The Intersections Between Motivation and Organizational Commitment

Organizational commitment refers to the alignment with the organization's goals and values. This alignment also includes a psychological aspect, reflecting an employee's willingness, necessity, and sense of duty to stay with the organization, which in turn shapes the employee-organization relationship (Meyer & Allen, 1991). Organizational commitment reflects

the degree of alignment between an individual and the organization. When employees experience high organizational commitment, they are more inclined to invest effort and contribute to the organization (Porter et al., 1974; Steers, 1979; Mowday et al., 1979). Organizational commitment arises as a result of positive feelings that individuals have toward their jobs. The connection between individual characteristics, job-related factors, and job performance also contributes to creating a favorable environment for strengthening organizational commitment (Yin, 2018).

Organizations rely on strong organizational commitment from employees to take precautions and overcome difficulties during times of crisis. For example, during the COVID-19 pandemic, when workers in sectors such as healthcare, retail, and transportation were confronted with unforeseen events, organizational commitment emerged as a crucial factor in navigating through the crisis. Employees with high levels of organizational commitment were able to adapt to new roles, take on non-routine tasks, and respond quickly to changes by reorganizing their work processes (Nembhard et al., 2020). Anand et al. (2023) explored the effects of benevolent leadership, job security, and burnout on employee commitment during crisis periods. According to the findings of their study, although benevolent leadership has a mediating role, both job insecurity and burnout negatively affect employees' organizational commitment (Anand et al., 2023).

A key reference in the field of organizational commitment, Meyer and Allen (1997), identified the affective commitment dimension, which refers to employees' sense of belonging, attachment, and involvement within the organization. Affective commitment is strongly positively correlated with factors such as employee engagement, job satisfaction, productivity, organizational citizenship behavior, and overall well-being. Consequently, understanding the link between affective commitment and employee motivation is especially crucial (Meyer et al., 2002).

Studies in the relevant literature emphasize that motivation positively influences employee performance through the mediating role of organizational commitment (Jufriadi et al., 2020; Astuti & Amalia, 2021; Darolia et al., 2024; Mohsen et al., 2004; Nguyen, 2020; Bytyqi, 2020). Jufriadi and Kusuma (2020) discovered that job motivation positively and significantly influences job performance, work engagement, and organizational commitment. According to the findings of their study, organizational commitment plays a mediating role in the relationship between job motivation and employee performance. Similarly, Astuti and Amalia (2021) demonstrated that organizational commitment mediates the relationship between job motivation and employee performance. Additionally, their study found that organizational commitment also functions as a moderating variable in the link between psychological capital, job satisfaction, and employee performance. In other words, organizational commitment, job motivation, and job satisfaction collectively play a critical role in influencing employee performance.

Darolia et al. (2024) explored the impact of job motivation, perceived organizational support and organizational commitment and on individual performance among male employees across different departments in India. The findings indicated that perceived organizational support has a positive impact on employee performance. Furthermore, perceived organizational support was identified as a significant catalyst affecting other variables. The study also revealed a positive correlation between motivation, organizational commitment and job performance (Darolia et al., 2024). According to Salleh et al. (2016), motivated employees tend to experience less pressure, enjoy their work, and thus demonstrate higher levels of organizational commitment. In contrast, unmotivated employees are more likely to be absent and show lower performance at work. In addition, normative commitment refers to the employee's perceived duty to remain with the organization. Employees with strong normative commitment feel morally and ethically compelled to stay, even if the benefits offered by other organizations appear more attractive. Opportunistic behavior and knowledge sharing are concepts associated with organizational commitment. Furthermore, normative commitment, as a sub-dimension of organizational commitment, exerts both direct and indirect effects on employee motivation (Nguyen, 2020).

In organizations where employees exhibit high levels of motivation, organizational commitment is also more likely to be present. Motivated employees who are committed tend to deliver high-quality services to customers (Mohsen et al., 2004). Although there is a positive relationship between motivation and organizational commitment, motivation accounts for only 36% of the variance in organizational commitment. In a study conducted in Vietnam with 639 entrepreneurs, it was found that opportunistic behavior and knowledge sharing play a mediating role in the relationship between motivation and organizational commitment. Affective commitment was found to have an indirect effect on motivation, while continuance commitment was shown to have both direct and indirect effects through opportunistic behavior. The findings also revealed that opportunistic behavior negatively affects knowledge sharing among employees in businesses. Furthermore, motivated employees tend to demonstrate increased performance (Bytyqi, 2020). In their study, Tella et al. (2007) identified a link between motivation, job satisfaction, and organizational commitment. However, their results also suggested a negative relationship between motivation and commitment. Although variations in job satisfaction were noted,

no significant correlation was identified between organizational commitment and years of experience. In contrast, Salleh et al. (2016) discovered a positive association between organizational commitment and motivation in their study involving employees from an engineering company.

In summary, considering the studies in the relevant field, the factors influencing organizational commitment are limited to motivation, job satisfaction, work environment, interpersonal relationships at the workplace, person-organization fit, and turnover intention (Bozeman & Perrew, 2021). In an effective organization, the goal is to foster a sense of commitment, satisfaction, fulfillment, and a spirit of collaboration. To achieve employee satisfaction and organizational commitment, both individual and organizational-level effective motivation are essential (Tella et al., 2007, p.1).

4. Method

4.1. The Purpose and Significance of the Study

This study employed a meta-analytic approach to assess the impact of motivation on organizational commitment. Meta-analysis can be described as a systematic approach to synthesizing research findings, and it involves combining the findings of surveys, correlational studies, experimental and quasi-experimental research conducted at different times and in various locations on the same subject. It enables the prediction of outcomes through analyses of analyses, utilizing larger sample sizes and stronger quantitative data by applying quantitative techniques (Rothstein, Higgins, Borenstein, Hedges, 2014 – Translated by S. Dinçer).

4.2. Population and Sample of the Study

In line with the purpose of the study, a systematic search was conducted in the "scholar.google" and "ProQuest" databases to identify relevant research to be included in the analysis. To determine the appropriate studies, the keywords ["job motivation" AND "organizational commitment"] were used, focusing on publications from the year 2020 onwards. As a result of the initial search, a total of 609 studies were identified. After applying the inclusion and exclusion criteria, 20 studies were deemed suitable for the meta-analysis.

Inclusion Criteria: The following criteria were used to determine the eligibility of studies for inclusion in the meta-analysis:

- The study must have been conducted using empirical methods.
- The study must report either a correlation coefficient and sample size together, or provide effect size values.
- The concept of commitment must be examined exclusively in terms of organizational commitment.
- The study must be published as a journal article.
- The publication must be in English.
- Tables and data must be accessible.
- Exclusion Criteria: The following studies were excluded from the meta-analysis:
- Studies in which the effect size was reported within a multiple regression table along with other variables,
- Theses and conference proceedings,
- Studies that used non-empirical methods (e.g., qualitative, bibliometric, or systematic reviews),
- Publications that were not written in English.
- Coding Process:
- The names of the studies, their sample sizes, and the correlation coefficients between the two variables were recorded by the researcher in Table 1, as part of the coding process for the meta-analysis.

Data Analysis

The analyses of the study were conducted using the CMA 3.0 software (Comprehensive Meta Analysis 3.0). To assess the effect of motivation on organizational commitment, pooled correlation coefficients and Fisher's Z transformation, along with Z-statistics and p-values, were evaluated. A significance level of 0.05 ($p < 0.05$) was considered in the analyses. Prior to the analysis, homogeneity-heterogeneity assessments were conducted. In meta-analytic studies, if the studies are homogeneous, their weights are similar, and a fixed-effects model is employed; if the studies are heterogeneous, a random-effects model is used. To determine which model (fixed or random effects) to apply, Q and I^2 statistics are utilized to test for homogeneity.

The Q-value provides limited information regarding heterogeneity. Specifically, if Q is smaller than the degrees of freedom (i.e., the number of studies minus one), the variance is estimated as zero. In contrast, if Q exceeds the degrees of freedom, the variance is estimated as positive. However, it is important to note that the Q statistic and the degrees of freedom offer only this specific information. Using the Q-value as an index of dispersion would be a methodological error. Despite this, researchers occasionally employ the Q statistic or the p-value derived from the heterogeneity test as indicators of heterogeneity, which is considered a mistake (CMA, 2024a: 130)

In this study, heterogeneity was determined based on the fact that the Q statistic was greater than the

degrees of freedom and the I^2 statistic was greater than 75. In certain research fields, it is common practice to categorize heterogeneity as low, moderate, or high based on the I^2 value reported in studies. However, this approach is fundamentally flawed. I^2 is a proportion, not an index of absolute dispersion, and as such, it does not provide information on the degree to which effects vary. The concept of using I^2 to create categories of dispersion is logically inconsistent. There are two key reasons why classifying heterogeneity as low, moderate, or high based solely on the I^2 value is erroneous. First, I^2 merely represents a proportion, not an absolute measure of variance, and therefore does not indicate the extent of variation. Second, categorizing heterogeneity without additional context is problematic, as the level of heterogeneity considered high in one context may be regarded as low in another (CMA, 2024a: 116). In this study, the Q and I^2 statistics were used solely to detect heterogeneity. Researchers often assume that heterogeneity reduces the utility of the analysis. However, the situation is more nuanced. The statistic that provides a clear indication of dispersion is the prediction interval. Despite its importance, researchers seldom report this interval and frequently confuse it with the confidence interval (CMA, 2024a: 80). In this study, the prediction interval (Fisher's Z statistic) is presented in Table 3. The bias assessment of the obtained results was conducted using Egger's regression intercept, Duval and Tweedie's trim and fill method, Begg and Mazumdar's rank correlation, Rosenthal's classic fail-safe N, and Orwin's fail-safe N test. The Egger test suggests evaluating the same bias by using precision to predict the standardized effect. When the t-value of the Egger statistic is lower than the critical t-value ($p > 0.05$), it indicates the absence of publication bias. Egger's linear regression approach, akin to the rank correlation test, assesses the bias identified through the funnel plot. Unlike Begg and Mazumdar's test, which is based on rank data, Egger's method utilizes the actual effect sizes and their associated precision. In this test, the standardized effect (calculated by dividing the effect size by the standard error) is regressed against precision, defined as the inverse of the standard error. Small studies typically have low precision, which is indicated by a high standard error. In the absence of bias, these studies are expected to show small standardized effects, while larger studies would exhibit larger standardized effects. This would produce a regression line with an intercept near the origin. However, if the intercept deviates from this expected pattern, it may indicate the presence of publication bias. For instance, this could happen if small studies are disproportionately linked to larger effect sizes. As with the rank correlation test, the significance test should be conducted with a two-tailed approach (CMA, 2024b: 92).

The Funnel Plot, utilized to identify potential missing studies and assess their impact on the meta-analysis, reveals that the difference between the observed values in Duval and Tweedie's Trim and Fill test and the adjusted values to account for publication bias is zero, indicating the absence of missing studies (i.e., a count of zero). This suggests that missing studies do not significantly affect the results of the meta-analysis. If the meta-analysis had included all relevant studies, the funnel plot would be expected to display symmetry, with studies evenly distributed on both sides of the overall effect. Therefore, an asymmetric funnel plot, characterized by a disproportionate number of small studies (representing large effect sizes) clustered to the right of the mean effect and fewer studies to the left, implies that studies on the left side may be missing from the analysis (CMA Report).

Duval and Tweedie developed a method to address this issue by imputing the missing studies. Specifically, their method estimates where the missing studies are likely to fall, incorporates them into the analysis, and recalculates the combined effect. The Trim and Fill method is grounded in the principle of the funnel plot, which assumes that, in the absence of bias, the plot should display symmetry around the overall effect. If there are more small studies on the right side than on the left, the concern arises that studies may be missing on the left. The Trim and Fill method imputes these missing studies, incorporates them into the analysis, and subsequently recomputes the summary effect size (CMA, 2024b: 89). To determine whether the number of studies included in the analysis influences the pooled correlation coefficient, Kendall's tau-b test was used. When the Z statistic obtained from this test exceeds the critical value ($p > 0.05$), it suggests that the number of studies does not significantly affect the result, indicating that the findings are reliable. To determine the number of studies required to invalidate the results, Rosenthal's classic fail-safe N test was applied. This test estimates how many additional studies would be needed for the pooled correlation coefficient to become non-significant, as well as the critical correlation coefficient and the required value for the pooled correlation (mean correlation) in those studies (Borenstein, Hedges, & Rothstein, 2007).

5. Findings

5.1. Descriptive Findings

The studies included in the research and the sample sizes are presented in Table 1.

Table 1. Information on the Studies Included in the Research

Study Name	r	n
Bytyqi 2020	0,599	207
Garaika & Jatiningrum 2020	0,575	367
Idoko & Nebo & Ukenna 2020	0,782	277
Manalo & Castro & Uy 2020	0,520	1098
Shahid & Siddiqui 2020	0,782	257
Soutloglou & Theriou 2020	0,280	132
Yılmaz & Vardarlıer 2021	0,280	216
Abuzaid & Al.Haraisa & Alateeq 2022	0,754	186
Kristanto 2022	0,393	96
Lu & Chen 2022	0,439	550
Malik et al. 2022	0,446	172
Chen 2023	0,412	485
Fauziyah, Akerina & Sugiharto 2023	0,839	75
Mmakola & Majola 2023	0,215	159
Dagondon 2024	0,497	378
Hsieh & Chiu 2024	0,885	212
Jung & Moon 2024	0,590	976
Kara & Acar 2024	0,609	391
Lin & Liu & Li 2024	0,680	450
Pelchona 2024	0,368	106
TOTAL	**0,547**	**6790**

A total of twenty studies investigating the relationship between motivation and organizational commitment, comprising a sample size of 6,790 participants, were included in the analysis. The average correlation observed across these studies was found to be 0.547.

4.2. Meta-Analysis Findings

Model Selection

The results of the Q and I^2 tests for heterogeneity/homogeneity, which determine the appropriate model to be used in the meta-analysis, are presented in Table 2.

Table 2. Test Results for Determining the Appropriate Model

		Value	df	SE / Variance	p	Result	Model
Test	Q	402,197	19	-	0,000	Heterogeneous	Random effect
	I2	95,276	-	-	-	Heterogeneous	Random effect
	Tau2 / Tau	0,062 / 0,249	-	0,026 / 0,001	-	Heterogeneous	Random effect

The results of the Q ($Q = 402.20 > df = 19$) and I^2 ($I^2 = 95.28 > 75$) tests for heterogeneity/homogeneity indicated a high level of variance (heterogeneity), suggesting that the random-effects model is the appropriate choice. Considering the expected study weights (100/20 = 5.000), it was observed that in the fixed-effects model, the study weights deviated significantly from the expected value (ranging from 1.07% to 16.27%), whereas in the random-effects model, the study weights were closer to the expected value and more evenly distributed (ranging from 4.40% to 5.30%) (Table 2; Figure 2)

Figure 2. Plot of Study Weights for the Relationship Between Motivation and Organizational Commitment

Meta-Analysis Results

The results of the meta-analysis examining the relationship between motivation and organizational commitment are presented in Table 3

Table 3. Meta-Analysis Results For The Relationship Between Motivation And Organizational Commitment

Statistic	Model: Random Effect
N	20
r	0,584
r (Lower Limit)	0,504
r (Upper Limit	0,653
Fisher's Z	0,668
SE	0,058
Variance	0,003
Fisher's Z (Lower Limit)	0,555
Fisher's Z (Upper Limit)	0,781
Z	11,561
p	0,000

A random-effects meta-analysis was carried out to assess the impact of motivation on organizational commitment. The results indicated that the effect of motivation on organizational commitment was statistically significant ($Z = 11.56$; $p < 0.05$). Due to heterogeneity, the random-effects model was deemed appropriate. The average correlation ($r = 0.584$) and Fisher's Z (Fisher's $Z = 0.668$) statistics suggest that the effect of motivation on organizational commitment is of a large magnitude ($R^2 = 0.446 > 0.25$), with the effect expected to range from 0.308 to 0.610 (Table 3, Figure 3).

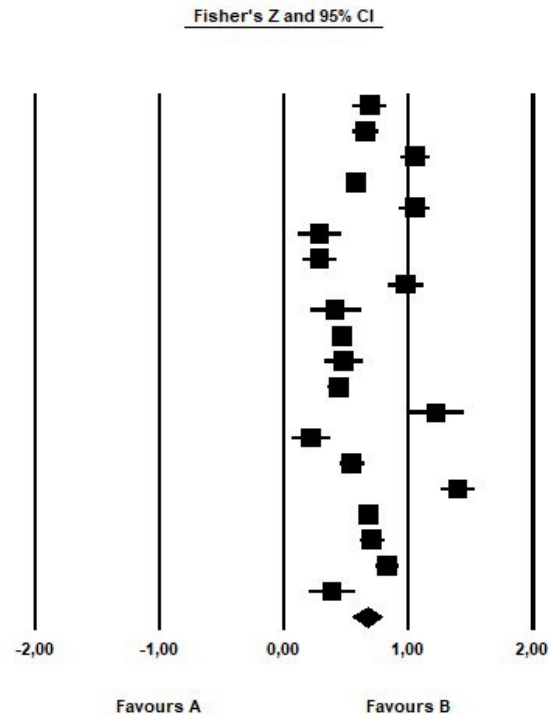

Figure 3. Effect Size Plot with 95% Confidence Interval

Findings on Bias

Table 4 presents the meta-analysis findings regarding the number of studies needed to nullify the results due to publication bias, the influence of potentially missing studies on the analysis, the overall pooled correlation, and the Fisher's Z statistics.

Table 4. Findings on Bias

Test	Statistic	Value	Result
Egger	Value	1,345	vNo publication bias
	SE	2,985	
	t	0,450	
	p (1-tailed)	0,328	
	p (2-tailed)	0,657	
Duval and Tweedie's Trim and Fill	Point estimate (Observed Values)	0,668	(Observed values - Adjusted values =0) Possible missing studies have no effect on the meta-analysis
	Point estimate (Adjusted Values)	0,668	
	Lower limit (Observed Values)	0,555	
	Lower limit (Adjusted Values)	0,555	
	Upper limit (Observed Values)	0,781	
	Upper limit (Adjusted Values)	0,781	
	Q (Observed Values)	402,19	
	Q (Adjusted Values)	402,19	

Tau b	Value (Without continuity correction)	0,010	The results in this study were not affected by the number of articles used
	Value (With continuity correction)	0,005	
	Z (Without continuity correction)	0,064	
	Z (With continuity correction)	0,032	
	p (1-tailed) (Without continuity correction)	0,474	
	p (1-tailed) (With continuity correction)	0,487	
	p (2-tailed) (Without continuity correction)	0,948	
	p (2-tailed) (With continuity correction)	0,974	
Classic Fail-Safe N	Observed Z	50,883	The number of studies is 222 required to bring the P value > alpha (according to Orwin's fail-safe N).
	(Rosenthal)	0,000	
	Alpha	0,050	
	Tails	2,000	
	Z	1,960	
	Number of Observed Studies	20	
Orwin's Fail-Safe N	Fisher's Z in observed studies	0,653	-
	Correlation in observed studies	0,574	
	Criterion for a "trivial" Fisher's Z	0,100	
	Mean Fisher's Z in missing studies	0,050	
	Criterion for a "trivial" correlation	0,010	
	Mean correlation in missing studies	0,050	

According to the results of the Egger test for studies examining the relationship between motivation and organizational commitment, no publication bias was found in the studies included in the research (Egger = 1.345; t = 0.450; p > 0.05) (Table 4). To evaluate the impact of missing studies on the meta-analysis, the Funnel Plot was analyzed, revealing a symmetric distribution of studies on both sides of the funnel (Figure 4). Similarly, the results of Duval and Tweedie's Trim and Fill test showed that the diffe-

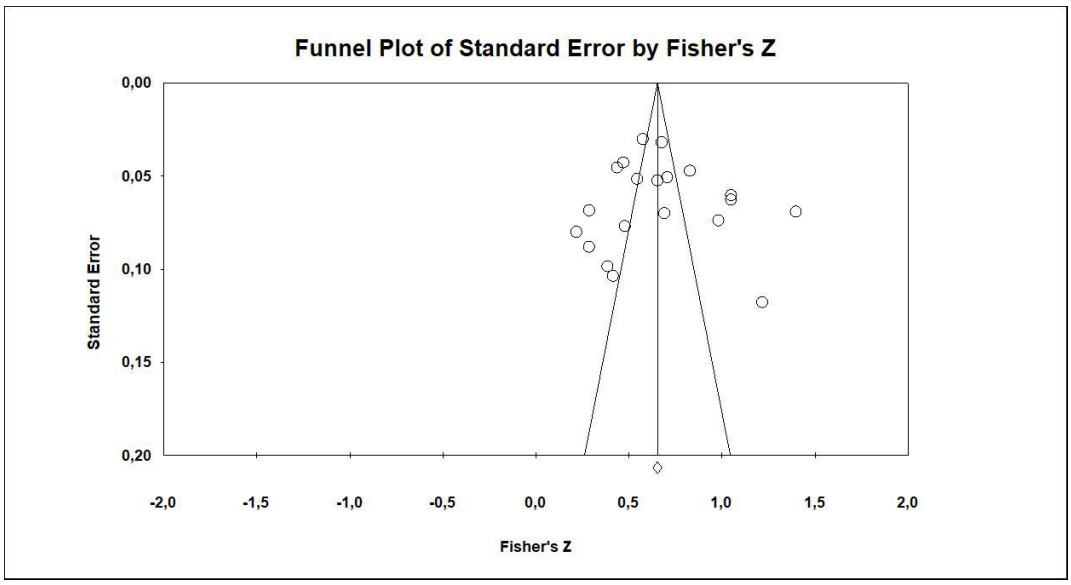

Figure 4. Funnel Plot

rence between the observed values and the adjusted values to correct for publication bias was 0.000 (0.668 - 0.668 = 0.000). Based on this finding, it was concluded that the impact of missing studies on the meta-analysis was negligible (Table 4). To determine the relationship between study size (number of studies) and effect size, the results of Kendall's Tau b test indicated that the number of studies included in the analysis had no effect on the obtained effect size (Tau b = 0.000; Z = 0.000; p > 0.05) (Table 4). In order to assess how many studies would be required to invalidate the obtained effect size, the results of Orwin's fail-safe N test revealed that 222 studies would be necessary for the pooled correlation coefficient to become non-significant (p > 0.05). The non-significance thresholds were Fisher's Z ≤ 0.100 and the correlation coefficient ≤ 0.100. Therefore, the average Fisher's Z correction value in these 222 studies would need to be 0.050, and the pooled correlation would need to be 0.100. Based on the overall findings related to publication bias summarized in Table 4, it can be concluded that publication bias does not influence the meta-analysis results of this study.

6. Conclusion

A meta-analysis was performed to investigate the connection between motivation and organizational commitment, incorporating 20 studies with a combined sample size of 6,790 participants. The analysis revealed a significant positive correlation between motivation and organizational commitment (r = 0.584). Moreover, motivation demonstrated a substantial effect on organizational commitment (R^2 = 0.446). To assess potential publication bias, an Egger test was applied, and the results confirmed the absence of any publication bias in the studies examining this relationship.

Considering the positive correlation between motivation and organizational commitment, it can be concluded that employees with higher motivation are more likely to show stronger organizational commitment. The Funnel Plot analysis revealed that the possible presence of missing studies does not have a significant effect on the meta-analysis outcomes. Additionally, the results from Kendall's Tau-b test indicated that the number of studies included in the analysis does not significantly influence the overall effect size.

According to the meta-analysis results, factors influencing motivation—particularly intrinsic motivation—play a significant role in enhancing organizational commitment. In other words, the individual's self-driven desire to achieve job-related goals through intrinsic motivation is also expected to increase job satisfaction. Given the positive and significant relationship between job satisfaction and organizational commitment, it can be inferred that an increase in motivation may also indirectly enhance organizational commitment (Van den Broeck et al., 2021). Studies in the relevant literature have examined the interrelationships between motivation and several other constructs that are both directly and indirectly affected by it, such as job satisfaction (Astuti & Amalia, 2021; Van den Broeck et al., 2021), performance (Astuti & Amalia, 2021), organizational citizenship behavior (Bozeman & Perrew, 2021), and organizational commitment.

Based on the findings, the relationship between motivation and job performance appears to be direct, and the level of job engagement may also play a significant role in this relationship (Jufriadi et al., 2020; Astuti & Amalia, 2021). In addition, job satisfaction is also considered to be an important factor influencing both motivation and performance (Astuti & Amalia, 2021). Similarly, in the context of intrinsic or extrinsic motivation, the expectation of rewards in return for one's actions may influence the level of organizational commitment (Fishbach & Woolley, 2022; Schulze & Steyn, 2003). In their meta-analysis exploring the relationship between Self-Determination Theory (SDT) and types of motivation, Van den Broeck et al. (2021) found that the identified types of motivation are consistent with the theoretical framework. This finding aligns with the results of the current study. In particular, intrinsic motivation was found to be the most significant type of motivation in terms of employees' well-being, behaviors, and attitudes. It was also identified as an important antecedent of job performance and organizational citizenship behaviors. Moreover, factors such as salary, recognition, and interpersonal relationships among employees were identified as key motivators in the relationship between motivation and organizational commitment. It was also found that affective commitment is strongly associated with high levels of motivation, while continuance commitment exhibits the weakest relationship with motivation (Madi et al., 2017). Additionally, Bang et al. (2013) further highlighted that job satisfaction mediates the relationship between motivation and affective commitment, one of the core dimensions of organizational commitment.

Madi et al. (2020) identified a strong relationship between motivation and organizational commitment. According to the findings of the study, "good wages" and "gratitude for a job well done" were found to be significant factors in the relationship between motivation and organizational commitment. According to the findings of a meta-analysis conducted by Mathieu and Zajac (1990), which reviewed 48 studies on the relationship between organizational commitment and motivation, attitudinal and calculative types of organizational commitment were emphasized as moderator variables. Riketta (2002) conducted a meta-analysis of 93 studies to examine the relationship between attitudinal orga-

nizational commitment and job performance. The findings revealed that extra-role performance was stronger than in-role performance. Furthermore, white-collar employees demonstrated higher levels of performance and organizational commitment compared to blue-collar workers. It was also found that self-evaluations yielded higher levels of performance and organizational commitment than supervisor ratings or objective indicators. This suggests that work environments that enable employees to engage in self-assessment may enhance both performance and organizational commitment. Additionally, age, tenure, and job level were found to have no significant impact on organizational commitment or performance. According to Riketta (2002), the relationship between organizational commitment and performance may vary across different cultural contexts. Eby et al. (2020) found that intrinsic motivation plays a partial mediating role in the relationship between extrinsic motivation and job attitudes. In this mediation model, extrinsic motivation variables were defined in terms of job characteristics and job context, while job attitudes were represented by affective organizational commitment and overall job satisfaction. The study particularly concluded that affective commitment has a significant and determining influence on the other variables. Trivellas (2011) highlighted the mediating role of organizational commitment in the relationship between employees' job motivation and job performance. According to the findings of the study, motivated employees demonstrated better performance as a result of mandatory human resource practices. Tett and Meyer (1993) conducted a meta-analysis to determine the relationship between job satisfaction, organizational commitment, turnover intention, and turnover, using 178 samples from 155 studies. According to the findings of the study, job satisfaction and commitment play a mediating role in the intention to leave the job. In addition, job satisfaction has a significant and strong effect on organizational commitment.

The literature often highlights the significance of job satisfaction in the relationship between organizational commitment and motivation (Van den Broeck et al., 2021; Astuti & Amalia, 2021; Ali & Anwar, 2021). Additionally, organizational commitment is commonly found to act as a mediating variable in the connection between motivation and other constructs, such as job satisfaction, job performance, and organizational citizenship behavior. Moreover, the connection between perceived organizational support and organizational commitment necessitates a multidimensional perspective, especially when examining factors such as organizational psychology, organizational behavior, and structural dynamics. It can be concluded that the factors influencing employee motivation are largely shaped by working conditions and the characteristics of the job itself.

It is noteworthy that studies examining the relationship between motivation and organizational commitment have been particularly concentrated up to the year 2020. Following the onset of the COVID-19 pandemic, the widespread shift toward digitalization necessitated a reorganization of work routines across organizations. As a result, it is believed that organizations were compelled to re-evaluate the relationship between motivation and organizational commitment. This study aims to assess the relationship between motivation and organizational commitment by focusing on research conducted between 2020 and 2025, and to identify other relevant concepts that influence this relationship. It is believed that conducting a meta-analytical evaluation based on post-2020 studies, in the context of shifting work paradigms, will offer valuable contributions to the field. Therefore, this study, by highlighting various concepts associated with motivation and organizational commitment, is expected to serve as an important reference for future research in this area. In summary; these findings may provide new insights for future studies intending to explore the interaction between motivation and organizational commitment. Therefore, in studies conducted particularly after 2020, it is expected that elements such as artificial intelligence and digitalization, which significantly affect the working environment, will generate new research questions within the context of this relationship.

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Research Article

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The Relationships between Perceived Organizational Support, Workplace Happiness, Organizational Trust, and Positive Meaning of Work: A Moderated-Mediation Model[1]

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Abstract

The purpose of this study is to examine the relationships between perceived organizational support (POS), workplace happiness (WH), organizational trust (OT), and positive meaning of work (PMW) by applying a moderated mediation model. 394 firefighters (96.2% male; 3.8% female) working in metropolitan municipalities in Türkiye participated in a survey consisting of POS, OT, WH, and PMW scales. IBM SPSS, IBM SPSS plug-in Process Macro, and Amos Package programmes were used for data analysis. The mediation model demonstrated that POS predicted PMW. At the same time, WH mediated the effect of POS on PMW. Moreover, OT positively moderated the relationship between POS and WH. In addition, the contingent effects of OT positively moderated the effect of POS on WH in all three conditions (one standard deviation below the mean, at the mean, and one standard deviation above the mean). The study demonstrated that POS, OT, and WH can increase the PMW. These findings provide important clues to increase the PMW, which is an important issue for employees.

Keywords: Perceived Organizational Support, Organizational Trust, Workplace Happiness, Positive Meaning of Work.

JEL Codes: D23, M12, M14

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1. Introduction

Firefighters work in many different disasters and emergencies, especially fires. Firefighters are exposed to high stress due to the nature of their work, experience time pressure, and can be physically and psychologically worn out. Firefighters contribute to their organizations with a collective approach, both aligned with the mission and vision goals of the organizations and aligned with their own career goals. Firefighters, like other employees, want to feel support from their colleagues and the organization in general for the work they do (Çelik, 2023). In this context, perceived organizational support (POS) (Eisenberger et al., 1986) has gained importance for firefighters, as it has in many different lines of work (Choi, 2020; Çelik, 2023). Employees contribute to their organizations, where they spend a significant amount of time in their lives. In this context, employees want to be valued by their organizations. For POS, the well-being, happiness, and perception of being valuable of the employee are important. When POS is evaluated from a general perspective, it is based on the relationship between the work the employee does and their expectations from the organization (Eisenberger et al., 1986; Eisenberger et al., 1990; Eisenberger et al., 1997; İplik et al., 2014; Kurtessis et al., 2017; Kraimer and Wayne, 2004; Özdevecioğlu, 2003; Rhoades and Eisenberger, 2002). İnan and Dönmez (2025) stated that POS acts as a buffer against negative situations within the organization. POS has played a positive role in the relationships between various variables in organizational management. Examples of some of these studies are: organizational commitment (Eisenberger et al., 1986; Loi et al., 2006; Riggle et al., 2009), decrease in turnover intention (Anafarta, 2015; Perryer et al., 2010), job satisfaction (Akkoca, 2023; Çelik, 2023), job performance (Riggle et al., 2009; Uçar and Kerse, 2022), OT (Polat, 2010), and WH (Novliadi and Anggraini, 2020; Salsabila and Febrianti, 2022). Studies in the literature reveal the importance of POS.

With positive psychology (Seligman & Csikszentmihalyi, 2000) coming to the fore in recent years, studies focusing on the positive mental well-being aspects of employees such as workplace happiness (WH) have become important (Fisher, 2010; Rodríguez-Muñoz & Sanz-Vergel, 2013). Happiness, which is one of the most basic emotions for people and is evaluated subjectively (Fisher, 2010), is considered a fundamental goal in terms of people's meaning in life and work (Diener, 2000). WH has an important place in the daily lives of individuals. In this context, WH is an important issue for both organizations and employees (Simmons, 2014; Turan, 2018). Muthukumaran Mariapan et al. (2023) found that the satisfaction levels of firefighters have a positive effect on WH. If the personnel working in an organization are happy and satisfied with their work, they can more easily cope with the difficulties they encounter in the organization compared to unhappier employees. Thus, it makes a significant contribution to performance from an organizational perspective (Gupta, 2012). In this context, as Page and Vella-Brodrick (2009) stated in their study, it is understood that the happiness, welfare, and well-being of the employee an important elements in achieving the goals set by the organization in line with its mission and vision.

One of the important variables of our study, organizational trust (OT), has become remarkable in terms of organizational studies. The mutual dependence of employees on their superiors, coworkers, and therefore on the organization they work for is inevitable in terms of achieving individual and organizational goals and objectives. At this point, the concept of OT gains importance in terms of employees acting in cooperation and being effective and efficient (Mayer et al., 1995; McAllister, 1995). In studies conducted by researchers from different periods and disciplines, a widespread view has prevailed regarding the positive contributions of trust to organizations (Dirks & Ferrin, 2001). Trust is the employee's tendency and desire to take risks instead of taking risks completely under all circumstances. This is the desire to be vulnerable (Mayer et al., 1995). Trust, from the perspective of a contemporary interdisciplinary approach, has been considered as a psychological phenomenon of accepting vulnerability based on positive expectations about someone (Rousseau et al., 1998). Although trust is sometimes considered similar to cooperation in organizations and is thought to provide cooperative behaviors, it is not considered one of the prerequisites of cooperation (Mayer et al., 1995). Risk and interdependence are seen as prerequisites of trust, which is the psychological state underlying behaviors such as cooperation and risk taking within the organization (Rousseau et al., 1998). In studies on firefighters, OT has been discussed in different contexts and in limited numbers (Colquitt et al., 2011; Flinchbaugh et al., 2024; Pratt et al., 2019; Rotenberg & Renhard, 2022). Shockley-Zalabak et al. (2000) stated that higher degrees of OT in terms of organizational trust climate will make organizations more advantageous in terms of success, adaptation, and innovation. Organizational crisis situations and organizational downsizing periods are the periods when the OT feeling is at the lowest level (Dirks & Ferrin, 2001). In this respect, the effectiveness of OT in achieving organizational goals and objectives is understood (Özler & Yıldırım, 2015).

Finally, when positive meaning of work (PMW), which is the dependent variable of our study, is considered, as understood from the other variables above, working life has reached an important point in the lives of individuals (Rapoport & Bailyn, 1997). Posi-

tive psychology has increasingly become important in terms of organizational management regarding working life. Among the positive psychology variables, PMW stands out as well as happiness and the meaning of life (Akçakanat & Kılınç, 2021). In organizational research, the interpretation of PMW is evaluated within the framework of cognitive, individuals' feelings and experiences (Rosso et al., 2010). The basis of the employee's perceptions towards PMW is the employee's own subjective evaluation (Wrzesniewski, 2003). Rosso et al. (2010) stated that the word meaning is generally perceived positively in the business literature, and PMW is the positive perceptions that the employee shows towards his/her job, and categorized PMW under four headings (the self, other persons, spiritual life, and the work context). It is understood that PMW buffers negative behaviors within the organization, in addition to leading to positive organizational behaviors (Alparslan et al., 2022). PMW has been investigated in different contexts with positive effects in terms of firefighters, but in limited studies (Dan et al., 2020; Roşca et al., 2021). In this context, PMW has been discussed in different organizational areas. In these studies, PMW has been found to be positively correlated with positive variables and negatively correlated with negative variables (Daniel, 2015; Fairlie, 2011; May et al., 2004; Steger et al., 2012). As understood from some of the studies given as examples, PMW is important in terms of organizational behavior.

2. Conceptual Model

In addition to the effect of individual factors, the organizational factors in which individuals evaluate their jobs as meaningful also have a significant effect. In this context, individuals working in organizations, managers in the organization they work in, their colleagues, and perceived organizational support (POS) in general can contribute to positive meaning of work (PMW) (Seçkin, 2018). We can also evaluate the relationship between the POS and the PMW in terms of "social exchange theory" (Blau, 1964) and "Organizational Support Theory" (Eisenberger et al., 1986). In this line, employees, thanks to POS, may find their jobs more meaningful and contribute more to the benefit of the organization. The positive impact and relationship of POS on PMW have been discussed in various studies (Akgunduz et al., 2018; Karagöz & Uzunbacak, 2024; Nair, 2020; Novanto et al., 2021). Within the framework of literature knowledge, it is thought that POS will have a positive contribution to PMW in terms of firefighters, and the H1 hypothesis is proposed in this line.

POS in organizations has a positive effect on the attitudes and behaviors of employees, their level of commitment to their organizations, and their perceptions of happiness. This situation can be evaluated in terms of "social exchange theory" (Blau, 1964; Rhoades & Eisenberger, 2002). Akgunduz et al. (2023) stated that this theory provides an important theoretical basis for the effect of POS on happiness. The thought that individuals are supported by the organization they work for contributes to their development of positive emotions (the organization commitment and job satisfaction, etc.) about the organization, which increases their workplace happiness (WH) levels (Joo & Lee, 2017; Akgunduz et al., 2023). The effect of POS on WH has been discussed in different studies (Akgunduz et al., 2023; Al-Taie, 2023; Novliadi & Anggraini, 2020). There are studies in the literature on the relationships between WH and PMW. However, these studies have generally studied the positive effect of PMW on WH (Charles-Leija et al., 2023; Mohsin et al., 2023; Yap & Badri, 2020). In our study, it is suggested that WH may also affect PMW. For firefighters, it is thought that WH will mediate POS and PMW, and hypothesis H2 is put forward.

Studies examining the relationship and effects between organizational trust (OT) and WH are very limited in number. Rahayuningsih (2019) explained the critical role of trust in the systematic review study on the positive effects of OT on organizations, as the development of working relationships to success the aims of the organization in line with its mission and vision. In her review, he found that OT provides positive results such as organizational citizenship, job satisfaction, organizational commitment, work performance, security motivation, increased levels of effective organizational communication, and reduced intention to leave the job. Januwarsono (2015) stated that employees who are happier at work have higher job satisfaction than other employees and found that OT is one of the determining factors for happiness at work. Çaçan & Demirtaş (2023) found that OT and WH are highly and positively correlated in their study on teachers. We can evaluate the basis of the relationship between OT and WH, as in the other two hypotheses, with regard to "social exchange theory. According to literature information, it is thought that OT perceived by firefighters will increase the relationship between POS and WH, and in this direction, H3 hypothesis was put forward.

The information given regarding the variables we discussed in the study reveals the importance of the study in terms of firefighters being more effective and efficient. In this context, it was aimed to investigate the effect of the support perceived by firefighters who intervene in disasters and emergencies and work within the framework of a hierarchical structure on the positive meaning of the work, as well as the mediating and moderating roles of their perception of organizational trust and workplace happiness.

2.1. Research Hypotheses

H1: Perceived organizational support (POS) predicts positive meaning of work (PMW).

H2: Workplace happiness (WH) will mediate the relationship between perceived organizational sup-

port (POS) and positive meaning of work (PMW).

H3: Organizational trust (OT) will increase the relationship between perceived organizational support (POS) and workplace happiness (WH).

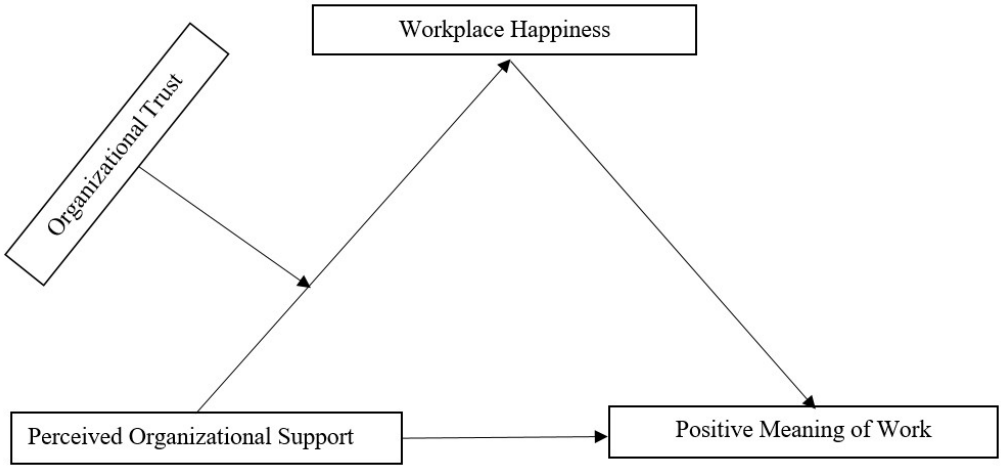

Figure 1. Research Model

3. Research Methodology

3.1. Measures

Perceived organizational support scale: To assess firefighters' perceived organizational support, this study used the abbreviated version of the scale originally developed by Eisenberger et al. (1986) and later refined by the same authors in 1997. Whereas the original scale contains 36 items, the short version contains 8 items, 2 of which are reverse-coded. The short form was preferred because of its previously established validity and reliability. The Turkish adaptation was carried out by Akalın (2006). In the current research, the scale showed high internal consistency with a Cronbach's alpha of 0.95.

Organizational trust scale: To assess the level of organizational trust among firefighters, this study used the Organizational Trust Scale originally developed by Tyler and Bies (1990) and later translated into Turkish by Polat (2009). The scale is unidimensional and consists of 4 items rated on a 5-point Likert scale. In the context of this research, the scale showed high internal reliability with a Cronbach's alpha coefficient of 0.90.

Workplace happiness scale: Firefighters' level of work happiness was measured using the short version of the Work Happiness Scale, developed by Polatcı and Ünüvar (2021). This one-dimensional scale comprises 8 items, each rated on a 5-point Likert scale. In the present study, the scale showed a high level of internal consistency, with a Cronbach's alpha score of 0.88.

Positive meaning of work scale: Developed by Steger, Dik, and Duffy (2012) to capture the positive meaning individuals derive from their work, this scale was adapted into Turkish by Durmuş (2023). It features a single-dimensional structure with 4 items rated on a 5-point Likert scale. In the scope of this research, the scale demonstrated acceptable reliability, with a Cronbach's alpha of 0.84.

3.2. Data Collection and Analysis

The study data were applied to firefighters actively working in metropolitan municipalities in Türkiye, who were reached by convenience and snowball sampling methods between 29.03.2025 and 20.04.2025, via Google Forms. Data were obtained from 394 samples in the study universe. Krejcie and Morgan (1970) stated that 384 samples would be generally sufficient. In this context, it can be said that the sample is sufficient.

The study checked the normality of all variables prior to data analysis. The normality assumption was checked to see if the skewness and kurtosis values were within the +/-2 range (George & Mallery, 2010). All assumptions were found to be met. Bootstrapping mediation tests were conducted to determine whether workplace happiness (WH) mediated between perceived organizational support (POS) and positive meaning of work (PMW). For both direct and indirect effects, 95% confidence intervals were used using 5000 bootstraps. Analyses with non-zero confidence intervals were considered significant. Moderated mediation, also known as conditional process analysis, was conducted using the PROCESS macro developed by Hayes (2018) and implemented in SPSS version 27, following the approach outlined by Preacher and Hayes (2008).

3.3. Ethical Considerations

Permission (28.03.2025 - E-95531838-050.99-130106) was obtained from Ağrı İbrahim Çeçen University Ethics Committee for this study.

4. Findings

Table 1. Demographic Information

Variables	Frequency (f)	Percentage (%)
Gender		
Male	379	96,2
Female	15	3,8
Age		
≤ 25	86	21,8
26-30	99	25,1
31-35	66	16,8
36-40	62	15,7
41 ≤	81	20,6
Education		
High School	91	23,1
Associate Degree	231	58,6
Undergraduate	64	16,2
Graduate	8	2,0
Duration of employment		
≤ 5	210	53,3
6-10	67	17,0
11-15	66	16,8
16 ≤	51	12,9
Salary status		
Inadequate	144	36,5
Moderate	197	50,0
Adequate	53	13,5

A total of 394 participants, 379 (96.2%) male and 15 (3.8%) female, were included in the study. Almost every age group participated in the study in close proportion to each other. When the education level of the participants is analysed, it is seen that the highest participation is at the associate degree level with 231 people (58.6%), and the lowest participation is at the graduate level with 8 people (2%). When the experience of the participants in the workplace is analysed, it is seen that the majority of them (210 people, 53.3%) have 5 years or less of work experience. When the participants' interpretation of the salary they receive in return for their work is analysed, it is understood that 86.5% (341 people) evaluate the salary they receive at an inadequate or medium level. An analysis of Table 2 indicates that the model's

Table 2. Confirmatory Factor Analysis Measurement Model Results

Indexes	Values	Acceptable values
CMIN/DF	3,531	<5
NFI	0.925	>0.90
IFI	0.945	>0.90
CFI	0.945	>0.90
TLI	0.936	>0.90
RMSEA	0.080	≤0.08

fit indices fall within acceptable ranges, suggesting an adequate alignment between the model and the data set (Gürbüz & Şahin, 2018).

Table 3. Correlation and Descriptive Statistics

Variables	1	2	3	4
1. POS	-			
2. OT	0.865**	-		
3. WH	0.836**	0.877**	-	
4. PMW	0.455**	0.450**	0.538**	-
M	3.08	3.02	3,27	4.13
SD	1.22	1.24	1.08	0.97
Skewness	-0.02	0.00	-0.02	-1.22
Kurtosis	-1.13	-1.11	-0,97	0.94

** p < 0.01.

In the study, the skewness and kurtosis values for all variables ranged from -1.22 to 0.94, indicating that the data distribution remained within acceptable limits for normality. This finding shows that the variables exhibit a distribution close to a normal distribution. According to Pearson correlation analysis results, there are significant and positive relationships between all variables. The correlations between POS and OT (r = 0.865), POS and WH (r = 0.836) and OT and WH (r = 0.877) are quite high. This shows that the variables have a strong structural relationship with each other (Field, 2018). The PMW variable is moderately correlated with the other variables (between r = 0.455 and r = 0.538). Table 3 presents the descriptive statistics along with the correlation coefficients for all the variables included in the study.

4.1. Mediation Analysis

Before determining whether there is a mediating effect, it was determined whether there is a direct effect. Perceived organizational support (POS) was found to directly affect positive meaning of work (PMW) (β= 0.36, p<0.001). However, when the mediating variable workplace happiness (WH) is included in the model, the effect of POS on PMW disappears (β=0.01, p>0.05). POS is also a positive predictor of WH (β=0.74, p<0.001). POS has a significant indirect effect on PMW through WH (indirect effect =0.35, SE=0.06, 95% CI= [0.23, 0.46]). These results support hypotheses H1 and H2 (Table 4). The results showed that WH influenced PMW. Moreover, the relationship between POS and PMW was mediated by WH.

Table 4. Analysing the İndirect Effect of POS on PMW through WH

Path	Coefficient	95% Confidence interval	
		Lower limit	Upper limit
POS --> WH --> PMW	0.35	0.23	0.46
Total effect	0.36	0.29	0.43
Direct effect	0.01	-0.11	0.14

4.2. The Analysis of Moderated Mediation

The situational mediation model was examined to determine whether there is a regulatory role of organizational trust (OT) in the positive meaning of work (PMW) effect of perceived organizational support (POS) via workplace happiness (WH). The proposed situational mediation model showed that OT mediated the PMW effect of POS through WH (see Table 5). According to the results, Hypothesis 3 was supported (Index of moderated mediation=0.019, SE=0.008, 95% CI= [0.003, 0.038]).

Table 5. The Analysis of the Moderated Mediation Model

		Consequent M (WH)			
Antecedent		Coeff.	SE	t	p
X (POS)	a1	0.27	0.04	6.74	<.001
W (OT)	a2	0.53	0.04	13,38	<.001
XW (POSXOT)	a3	0.04	0.02	2.31	<.05

Constant	iM	3.21	0.03	94.38	<.001
				R2 = 0.80	
				F = 506.26; p < .001	
				Y(PMW)	
X (POS)	c'	0.01	0.06	0.22	>.05
M (WH)	b1	0.47	0.07	6.74	<.001
Constant	iy	2.59	0.23	11.17	<.001
				R2 = 0.29	
				F = 79.76; p < .001	

Conditional indirect effect(s) of POS on PMW

OT	Bootstrapped indirect effect	Boot SE	Boot LLCI	Boot ULCI
–1 SD	0.10	0.03	0.04	0.17
M	0.13	0.03	0.07	0.20
+1 SD	0.15	0.04	0.08	0.24

Index of moderated mediation

	İndeks	Boot SE	Boot LLCI	Boot ULCI
OT	0.0197	0.0089	0.0034	0.0386

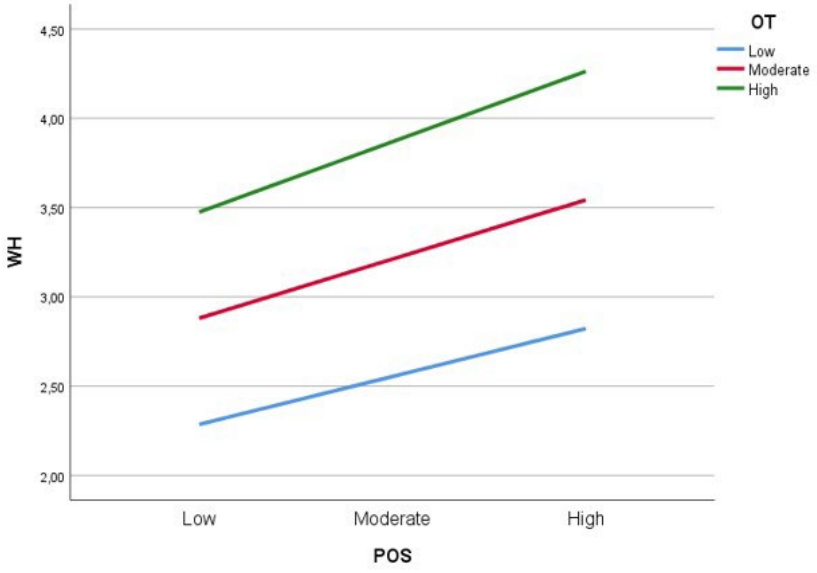

Figure 2. Moderating Effect for the Organizational Trust

The research explored how OT shaped the link between POS and WH by evaluating its effect at three points: below average, average, and above average levels. The results indicated that OT played a regulatory role in this relationship across all levels. The moderation effect was statistically significant across all three levels—low (β = 0.10, 95% CI [0.04, 0.17]), average (β = 0.13, 95% CI [0.07, 0.20]), and high (β = 0.15, 95% CI [0.08, 0.24])—as presented in Table 5.

5. Discussion and Conclusion

This study examined the relationships between the variables of perceived organizational support (POS), workplace happiness (WH), organizational trust (OT), and positive meaning of work (PMW) within the situational mediation model. Conducted among firefighters employed by metropolitan municipalities in Türkiye, the study revealed that workplace happiness fully mediates the relationship between perceived organizational support and positive meaning

of work, and that organizational trust significantly strengthens this process.

The firefighting profession requires special consideration in terms of employee well-being due to its high stress levels, risk of physical and emotional exhaustion, and need for constant emergency response (Dan et al., 2020; Roșca et al., 2021). In this context, the support that employees perceive from their organizations is critical for both work-related aspects and their psychosocial well-being. As our study shows, firefighters who perceive high organizational support find their work more meaningful; this effect stems from the positive meaning they attribute to their work. This finding shows that employee happiness is not just an individual emotion, but also an important part of how people make sense of things (Steger et al., 2012; Charles-Leija et al., 2023).

Research has revealed that trust in an organizational context is a driving force for employee happiness, significantly increasing the impact of perceived organizational support on the positive meaning of work. For those working in high-risk jobs in particular, a sense of organizational trust protects emotional resources, reduces burnout, and promotes happiness (Flinchbaugh et al., 2024). Examining this topic in the context of firefighters specifically, it has been observed that trust in colleagues and management can indirectly enhance the meaning of work (Colquitt et al., 2011; Pratt et al., 2019).

These findings are consistent with social change theory (Blau, 1964). Employees who feel supported and trusted within an organizational context reciprocate with positive attitudes and behaviours. This sense of happiness, developed through organizational support and trust, enables employees to value their work (Akgunduz et al., 2023).

It is important for organizations to strengthen the perceived support mechanisms for their employees. Particularly in high-stress occupations, managers' open communication, appreciation of employees' achievements, and sensitivity to individual needs will increase perceptions of support (Eisenberger et al., 1986; Rhoades & Eisenberger, 2002).

Based on these findings, it is recommended to develop organizational policies to support employee happiness. Providing work-life balance programmes, psychological counselling services, and opportunities for social interaction within the team will increase employees' happiness levels (Bakker & Demerouti, 2007), thereby enhancing PMW. Lutgen-Sandvik et al (2011) stated that positive emotions in the workplace reveal the communicative structure and micro-processes, which are explained with examples.

Based on the findings, it can be said that OT should be systematically built. In this direction, fair management practices, transparent decision-making processes, and ethical leadership behaviour should be brought to the fore. Studies by Tan and Tan (2000) and Kramer (1999) also demonstrate that high levels of organizational trust contribute to employees' higher levels of identification with their organizations and to their finding more meaning in their work.

The restriction of the study's scope to a sample of firefighters may impede the generalizability of the findings. Further research is required to test analogous models in diverse sectors and with different samples, particularly those working under high stress, such as healthcare workers, law enforcement officers, and educators. This will contribute to a more comprehensive understanding of the organizational factors that influence the positive meaning of work. Indeed, as Schnell et al. (2013) have noted, the positive meaning of work can be examined at the individual, organizational, or societal level. Recent studies have also demonstrated that the concept of work is subject to variation across different sectors, with the organizational context being identified as a critical factor in shaping this meaning (Allan et al., 2019).

In addition, subsequent studies may wish to take into consideration the interaction between individual characteristics (for example, psychological resilience, subjective well-being) and organizational factors. In particular, the development of intervention-based models and the use of experimental designs may clarify causal relationships.

In conclusion, the present study has revealed that a supportive, trust-based work environment that prioritises employee happiness contributes significantly to employees finding meaning in their work. The findings obtained from the sample of firefighters, who undertake high-stress and high-risk tasks, indicate that such organizational conditions are decisive in terms of employees' psychological well-being and the meaning they derive from their work. In this context, organizations that fail to establish a supportive and trusting environment risk not only employee engagement but also their long-term performance, organizational sustainability, and institutional resilience in times of crisis. It is recommended that future studies across different sectors test the generalisability of these findings. This should be achieved by experimentally testing the effects of organizational intervention programmes.

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Research Article

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Artificial Intelligence In Universities: A Study On Academics' Views[1]

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Abstract

Artificial intelligence (AI) has led to rapid and profound transformations in sectors such as education, health, and public administration. Universities are in a key position in this transformation with their role in advancing knowledge production and educating individuals equipped with digital skills. This study examines the perceptions of academics working at universities in the Çukurova Region of Turkey regarding AI, their usage patterns, and the challenges they face. Semi-structured interviews were conducted with 22 academics, and the data were analyzed using MAXQDA 2024 software.

The findings show that AI tools—especially applications such as ChatGPT—are used mainly at the individual level, in areas such as course preparation and research support. However, we understand that this use is largely superficial, with infrastructure deficiencies and insufficient ethical guidance limiting the integration process. Therefore, the integration of AI in higher education should not only be considered as a technical development but also as a multi-layered transformation process with ethical, cultural, and organizational dimensions. While this study calls the reader to rediscover the core values of being human in the face of technology, it also prepares the ground for change in concrete educational policies and practices with its suggestions.

Keywords: Artificial Intelligence, ChatGPT, Academic Views, Higher Education, Maxqda.

JEL Codes: I23, M15, 033

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1. Introduction

AI has quickly become one of the most important drivers of digital transformation in higher education. People used to think of AI as a futuristic idea with a lot of promise. Now, though, it is a real force that is changing how universities work, how teachers teach, and how students learn. Colleges and universities are now looking at the bigger ethical, educational, and institutional effects of using AI in schools, not just the technical ones. AI has transitioned from a theoretical concept to a practical application.

Students and researchers have been very interested in the increasing use of AI tools like ChatGPT. People in many different fields use these tools, like writing papers, getting help with research, making content, and helping with administrative tasks. As these technologies become more common, many important questions come up: How do teachers know what they are and how to use them in class? How well do colleges have the right rules, infrastructure, and procedures in place to use AI tools in a way that is both ethical and long-lasting?

Are professors ready to teach their students how to use AI in a responsible way?

The Çukurova Region of Turkey is known for having a diverse academic community and a growing educational infrastructure. This study wants to answer these questions by looking closely at this region. The study employed a qualitative method, conducting in-depth interviews with 22 scholars from six different universities in the area. The study's goal is to put the real-life worries, experiences, and insights of faculty members at the top of the list. We must examine AI's use, perception, and application in teaching and research, not just its theoretical benefits.

This approach emphasizes the important role of faculty members in making sure that the integration of AI into university systems follows academic standards and ethical concerns.

This study uses MAXQDA 2024 software to collect and analyze qualitative data. It tells us a lot about how to use AI in higher education in a smart and moral way. The results of this study can help school leaders, policymakers, and curriculum developers deal with the problems that come up when schools use AI. The study gives useful advice on how to make rules, set up classes, and train teachers in a way that promotes a fair, moral, and useful use of AI in regional universities, where academic life is different from other places. This study emphasizes the importance of involving faculty members in the process. They need to know how to use AI and have the moral frameworks to help students use these powerful tools.

2. Conceptual Framework and Literature Review

Since the middle of the 20th century, people from many different fields have helped to shape the ideas and theories behind AI. Nilsson (1998) says that technology and information systems will work better if you combine artificial intelligence with knowledge. Kurzweil (2001), on the other hand, says that AI is a system that copies how people think and uses that to control machines. Fathima Anjıla PK (1984) states that AI consists of systems that perform tasks in a manner similar to how people do them. These methods show that AI is both a new technology and a powerful force for change in society. Artificial intelligence, which was presented in science fiction movies in the past with its dystopian or utopian dimensions, has turned into a reality that permeates every aspect of life today.

Feng (2021) emphasizes that technological developments in computing, data processing, and data storage have contributed to the popularity of artificial intelligence in many disciplines, including social sciences and humanities. Villarreal et al. (2023) argue that with the rise of intelligent systems, the need to understand the perspectives of these "entities" has never been more critical. This points to the need to consider AI not only as a technical but also as a social and cultural phenomenon.

Although it is difficult to agree on a standard definition of AI due to its interdisciplinary nature (Crompton & Burke, 2023), the example of Stanford University shows how this multidimensionality is reflected in education. Lu (2025) reveals that the university's liberal arts-based education model and its collaborations with Silicon Valley paved the way for pioneering initiatives in human-centered AI education. Programs such as Stanford AI4ALL are among the examples that embody the interdisciplinary approach.

Historically, the Dartmouth Conference organized by McCarthy, Turing, and other scientists in 1956 was the turning point in which artificial intelligence as a research discipline was established (Feng, 2021; Kline, 2010). With this conference, artificial intelligence became a field that could transform cognitive functions and social systems. Artificial intelligence is used in many subfields, such as machine learning, perception, creative writing, autonomous driving, and medical diagnosis (Doğan et al., 2025). Zeydan (2024) and Schiessl et al. (2022) found a significant increase in publications on artificial intelligence in the post-2016 period. Crompton and Burke (2023)

state that the studies conducted in the 2021-2022 period are student-oriented, and the use of AI in higher education is spreading rapidly. The evidence shows that education and academic research practices are being transformed. Islam and Islam (2023) evaluate the impacts of AI in four main dimensions within the framework of research, education, personal skill development, and social contexts. Villarreal et al. (2023) analyze the interaction process with these technologies through "thing ethnography" to understand the opportunities offered by productive AI tools such as ChatGPT in education.

While Bareh (2025) addresses the contribution of big language models to the thematic synthesis process in qualitative research through content analysis and a SWOT approach, Kujundziski and Bojadjiev (2025) analyze the institutional guidelines for generative AI in German universities, focusing on AI literacy, ethical principles, and strategic integration processes. Both studies reveal that AI plays a critical role in pedagogical transformation and institutional planning. While Qian et al. (2025) assess the potential of AI-based technologies in education reform and resource optimization, Henadirage et al. (2025) draw attention to barriers such as lack of policy, digital inequality, and cultural resistance through the case of Sri Lanka. These studies raise the necessity of holistic policies for the sustainable integration of AI, especially in the context of the Global South. Hmoud et al. (2024) show that generative AI contributes to learning processes by revealing the positive effects of using ChatGPT on students' task motivation.

In conclusion, the literature's theoretical and empirical findings make it clear that AI should be considered more than just a new technology in higher education systems. We should view it as a complex tool for change, requiring restructuring at the levels of teaching, ethics, and institutions. Table 1 shows how the sources used in this study, which looks at the role of artificial intelligence in higher education,

Table 1. Literature Used in Research on Artificial Intelligence in Higher Education

Theme	Sources	Description
1. Conceptual and Historical Foundations of AI	Nilsson (1998), Kurzweil (2001), Fathıma Anjıla PK (1984), Feng (2021), Kline (2010)	Studies provide theoretical definitions, early foundations, and interdisciplinary perspectives of AI.
2. Pedagogical Applications and Learning Innovation	Siemens & Long (2011). Holmes ve Fadel (2019), Zhai vd. (2021), Doğan vd. (2025), Stan vd. (2025), Luckin vd. (2022), Hmoud vd. (2024), Vilarino (2025), Zawacki-Richter, Marín, Bond, & Gouverneur (2019)	Works exploring AI in teaching, learning design, and educational transformation.
3. AI Literacy, Academic Readiness, and Faculty Perception	Wang vd. (2025). Gayed (2025), Dempere vd. (2023), Crompton & Burke (2023), Chan & Hu (2023), Francis vd. (2025), Smith (2022)	Research on AI awareness, digital skills, and academic adaptation in higher education.
4. Ethics, Integrity, and AI Risks in Academia	Royer (2024), Dockens ve Shelton (2025), Oladele (2024), Escotet (2023), Minkkinen vd. (2022), Olorunfemi vd. (2024), Güner vd. (2025), Zawacki-Richter vd. (2019), Popenici & Kerr (2017)	Sources discussing academic ethics, bias, transparency, and responsible AI use.
5. Strategic Governance and Institutional AI Policy	McDonald vd. (2025), Francis vd. (2025), Korseberg ve Elken (2024), Kujundziski & Bojadjiev (2025), Ataş & Gündüz (2019)	Papers examining university-level AI policies, planning, and administrative frameworks.
6. Regional, Infrastructure and Cultural Contexts	Henadirage vd. (2025), Hamedinasab & Rahimi (2025), Abdurashidova vd. (2023), Livberber ve Ayvaz (2023)	Studies focusing on barriers and adaptation in diverse regional and sociocultural contexts.
7. AI Tools in Research and Academic Support	Tate vd. (2023), Villarreal vd. (2023), Bareh (2025), George & Wooden (2023), Zeydan (2024), Schiessl vd. (2022)	Research on the integration of AI tools for research enhancement and administrative automation.
8. Methodology, Question Design, and Survey-Based Literature	Eti (2025), Ünal & Yıldırım (2024), Soldan (2022), Arığaslan (2025)	Methodological studies on interview guides, AI-based survey tools, and sampling design.

Source: Created by the author with artificial intelligence support.

are grouped by theme.

2.1. Artificial Intelligence in Higher Education

AI is having a big impact on how colleges and universities teach, do research, and train people. According to Zawacki-Richter et al. (2019), colleges use AI in many ways, such as to help students plan their courses and make course materials. Siemens and Long (2011) say that these technologies improve productivity and help students learn by making it more personal. Holmes and Fadel (2019) say that AI-supported solutions can help students do better in school and help teachers manage their time better in big classes by giving each student individualized content depending on how they learn best and how fast they learn.

Research on the application of AI in colleges and universities reveals that these technologies can assist in various aspects of teaching. It is important to note, nonetheless, that several essential problem areas should not be overlooked in addition to these contributions. While Kutlucan & Seferoğlu (2024) draw attention to issues such as the privacy of student data, biases in algorithms, and changes in the roles of instructors, Smith (2022) points out the importance of instructors having sufficient digital literacy levels for a sustainable AI integration.

The application areas of AI are not limited to teaching and assessment. Hannan & Shuguang (2021) state that many administrative and support processes in universities, such as enrollment management, library automation systems, academic success prediction, student satisfaction analysis, and campus security, are also made more efficient with AI algorithms. George & Wooden (2023) reveal that processes such as literature search, resource management, hypothesis testing, and data analysis in research activities are increasingly integrated with AI tools.

Zhai et al. (2021) state that using AI in education strengthens its theoretical foundation and creates a channel for collaborative research between educators and AI engineers. Stan et al. (2025) state that ChatGPT has the potential to increase student engagement and improve learning outcomes. In this context, it is emphasized that strategies for its effects on language skills, age-related technology integration, and teacher training should be developed. Tate et al. (2023) explain that tools like Iris.ai, Semantic Scholar, and VOSviewer help with reviewing literature, while Scite, SciScore, and iThenticate assist with understanding citations, checking if reports are suitable, and detecting plagiarism. They also emphasized that effective prompt strategies should be developed to reach the correct conclusions, and AI outputs should be ethically verified and used.

According to Villarreal et al. (2023) and Bareh (2025), the SWOT assessment clearly outlines the strengths, weaknesses, opportunities, and threats of using AI-supported academic tools. It guides students and researchers in terms of ethical and safe integration processes. In the following, the author presents a blended SWOT analysis of the use of AI-assisted academic tools, combining the information provided by the authors. This SWOT analysis will also provide guidance for students and researchers on how to integrate more effectively, safely, and ethically (Villarreal et al., 2023).

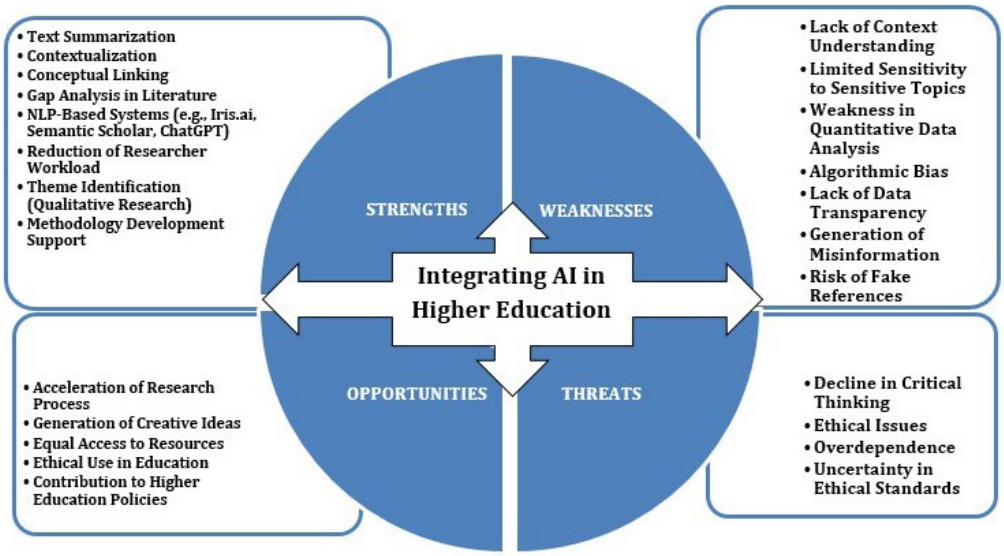

Figure 1. SWOT Analysis for the Use of Artificial Intelligence in Higher Education

Source: Based on Tate et al. (2023), Villarreal et al. (2023) and Bareh (2025).

Using the grounded theory approach, Hamedinasab and Rahimi (2025) identified the main barriers to artificial intelligence applications in higher education based on the opinions of 14 educational technology experts. Among these obstacles, technological infrastructure deficiencies, cultural-religious resistance, uncertainties in legal regulations, and human resource inadequacies stand out. Hammad (2023) states that AI systems, such as large language models, cannot still generate original ideas and develop creative thinking; these systems are based on statistical modeling and probabilistic operations. However, it is also predicted that advanced algorithms capable of generating entire chapters of scientific papers may emerge shortly.

Luckin et al. (2022) propose a seven-stage model, the GenAI Readiness Framework, to support educators using AI ethically and effectively in a pedagogical context. This framework includes raising awareness of the possibilities offered by AI, solving educational problems through AI, structuring data collection and analysis processes, and re-evaluating and optimizing learning processes. This framework, called EThICAL, is defined as follows:

1. Excite: Introducing the possibilities offered by AI in a way that generates excitement.

2. Tailor and Hone: Concretize and specify educational problems in a way that AI can solve.

3. Identify: Define the available data and explain how it relates to the problems.

4. Collect: Collect the additional data needed to solve the problems that have become clear.

5. Apply: Choose the appropriate AI technique and start applying it.

6. Learn: Analyze, check the results and make inferences from the data obtained.

7. Iterate: revisit, improve and recheck the process based on the results.

As a result, artificial intelligence technologies in higher education should be considered a digital innovation and a pedagogical, ethical and managerial transformation tool, and multidimensional strategies should be developed accordingly.

2.2. Ethical Dimension of Artificial Intelligence in Higher Education Institutions

The swift incorporation of artificial intelligence (AI) into higher education has necessitated immediate discourse over its intellectual, ethical, and pedagogical ramifications. Tate et al. (2023) characterize the increase in AI-generated journal submissions as a "impending tsunami." Zhai et al. (2021) caution that inappropriate utilization of AI may alter the functions of educators and learners, leading to social and ethical dilemmas. Royer (2024) contends that technologies such as ChatGPT are revolutionizing assessment, authenticity, and critical thinking in academics, highlighting the necessity for a measured, critical appraisal rather than uncritical optimism or apprehension.

Even though AI makes things more efficient, issues like digital inequality and compromised assessment integrity show how important it is to rethink how things are done now.

AI makes academic work easier by quickly processing data, finding patterns, and summarizing information. However, it also causes big problems like algorithmic bias, lack of ethics, false information, and a lack of creativity. Because of these issues, organizations need to have clear rules about what is right and wrong. Using only computers to grade could make academics less fair. Escotet (2023) says that AI should help teachers make decisions, not take over for them. Faculty should still be able to make evaluations.

Another big reason why students use AI tools is that they trust them.

Güner et al. (2025), Zawacki-Richter et al. (2019), Popenici and Kerr (2017), and Gayed (2025) all talk about the good and bad sides of using AI in higher education, including moral, teaching, and administrative issues. Güner et al. talk about how useful big language models are, but they also say that they can make data less safe and make people think less critically. Zawacki-Richter et al. talk about how AI can help with distance learning and say that cultural and moral issues should get more attention. Popenici and Kerr agree that AI should be used in schools in a way that is ethical and focuses on people. However, Gayed says this is hard to do because schools don't give enough direction.

Dockens and Shelton (2025), Korseberg and Elken (2024), and Oladele (2024) all write a lot about how schools use generative AI (GAI). Dockens and Shelton talk about how useful it can be for publishing and processing data, but they also warn about moral issues and a lack of digital literacy. Korseberg and Elken say that tools like ChatGPT change how knowledge is created and what values are important in school. They want organizations to talk to each other and make plans that include people from a wide range of fields. Oladele says that ethics are very important in AI-based evaluations and that they should be taught to students and used in school governance. All of these studies agree that GAI needs a strong moral and educational base to work well.

Gayed (2025) also says that teachers are generally okay with AI, but schools don't support it, so it can't be used. At the same time, McDonald et al. (2025) and Francis et al. (2025) stress how important it is for colleges and universities to have clear rules about AI. According to McDonald et al., colleges in the U.S. are making rules about how to use generative AI in class. Francis et al. say that we need to think about the pros and cons of generative AI in light of our worries about fairness, ethics, and academic

honesty. They both say that policies aren't enough; people also need to know how to use AI.

To make sure that AI is used in a responsible way, ethical assessments must put accountability, openness, explainability, and fairness at the top of the list (Minkkinen et al., 2022). Universities should set up monitoring groups and teach students both ethics and digital skills to build trust and acceptance.

In conclusion, AI in higher education is a big change not only in digital skills but also in teaching, ethics, and governance. As Ataş and Gündüz (2019) argue, successful implementation depends on professional development, student digital literacy, and institutional policies addressing ethics and data security. Only under such conditions can AI be applied equitably, efficiently, and sustainably in academic contexts.

Crompton and Burke (2023) emphasized that the use of artificial intelligence in higher education generally focuses on students and that studies considering academics' views will fill the literature gaps. This study aims to examine the perspectives of academics in the Çukurova Region on artificial intelligence technologies and how they integrate them into their universities and educational processes. The study constitutes a critical step in planning the effective use of artificial intelligence technologies. The study looks at how schools use AI tools, especially ChatGPT, what they are used for, and how adding AI to schools can make learning better. It also looks at the suggestions of academics very carefully to see which factors can speed up the adaptation process and make it work better. The research uses qualitative research methods.

3. Research Method

3.1. Purpose and Research Design

The goal of this study is to find out what university professors in Turkey's Çukurova Region think about using artificial intelligence (AI) technologies in higher education. We used interpretative phenomenological analysis (IPA) as a qualitative research method to get a better idea of how academics think about, experience, and deal with AI. We chose this approach to focus on how each person experiences and makes sense of using AI in school.

3.2. Participants and Sampling

There were 22 academics (12 women and 10 men) in the study group. They came from six universities in Adana, Mersin, and Osmaniye. The institutions were state and foundation universities that offered a variety of academic fields, such as education, engineering, medicine, and social sciences. We used a purposive sampling method to choose participants with different levels of knowledge about AI. These included professors, associate professors, assistant professors, lecturers, and research assistants. This variety made sure that a lot of different points of view could be seen.

3.3. Data Collection

Data were collected through semi-structured interviews, which allowed for the flexible exploration of key themes while maintaining consistency across participants. The interview protocol consisted of 12 open-ended questions developed based on the literature (Eti, 2025; Ünal & Yıldırım, 2024; Soldan, 2022; Aruğaslan, 2025, Livberber & Ayvaz, 2023, Dogan et al. 2025, Villarreal et al. 2023, Crompton & Burke, 2023). Topics included participants' AI literacy, frequency and context of AI use, ethical concerns, institutional readiness, and suggestions for effective integration.

Interviews were conducted face-to-face (n=10) and via telephone (n=12), depending on participant availability. Each interview lasted between 8 and 28 minutes, with an average of 18 minutes. All interviews were audio-recorded and transcribed verbatim to ensure accuracy. İnterwiew questions:

- Have you ever received training related to artificial intelligence?
- Do you use AI-supported applications in your daily life? Which ones?
- How would you define artificial intelligence?
- Do you use artificial intelligence technologies at your university? In which areas?
- How do you integrate artificial intelligence technologies into your teaching and research processes?
- How do you evaluate the impact of artificial intelligence applications on the education process? (For example, do these technologies provide convenience in exams, course management, and student guidance?)(What kind of convenience?)
- In your opinion, what are the attitudes of stakeholders such as students, academic staff, and management towards using artificial intelligence technologies in universities?
- How do you think these attitudes contribute to the adoption of technology?
- What factors should be prioritized for adopting and effectively using artificial intelligence technologies in universities? What can be done to facilitate this process?
- Do you think a framework should be developed for the more effective adoption of artificial intelligence in higher education institutions in Turkey?
- What factors should be considered for the more

qualified use of artificial intelligence in higher education institutions?

- What kind of work have you done with the latest artificial intelligence support?

3.4. Data Analysis

MAXQDA 2024, a computer program that helps with qualitative data analysis, was used to look at the qualitative data. We used thematic analysis to find patterns, groups, and new themes. The coding method used Braun and Clarke's (2006) six-phase model, which included getting to know the data, making initial codes, looking for themes, reviewing themes, defining and labeling themes, and writing the report.

In addition to traditional coding, code frequency analysis, code co-occurrence matrices, and conceptual maps were generated within MAXQDA to enhance the depth of interpretation. These tools facilitated the identification of relationships among key themes such as ethical concerns, academic applications of AI, institutional infrastructure, and pedagogical impacts.

3.5. Trustworthiness and Ethical Considerations

To ensure research rigor, the criteria proposed by Lincoln and Guba (1985) were applied:

- Credibility: Achieved through member checking and prolonged engagement during
- interviews.
- Transferability: Supported by providing rich, thick descriptions of context, participants,
- and procedures.
- Dependability: Ensured via an audit trail detailing each step of data analysis.
- Confirmability: Maintained by the researcher's reflexive notes and triangulation of data.

Prior to data collection, ethical approval was obtained from Çağ University's Ethics Committee. Participants were informed about the purpose of the study, and written or verbal consent was obtained. Confidentiality and anonymity were preserved throughout the research process.

4. Findings

This section presents the thematic and analytical findings derived from in-depth semi-structured interviews conducted with 22 academics employed across six higher education institutions in Turkey's Çukurova Region. The data were subjected to qualitative content analysis using MAXQDA 2024, incorporating code frequency matrices, co-occurrence charts, and conceptual mapping. The findings are organized around core thematic axes that reflect both the current landscape and the nuanced challenges of AI integration in academic contexts.

4.1. Participant Demographics and Institutional Diversity

As shown in Figure 2, the participant group consisted of 10 male (45.5%) and 12 female (54.5%) faculty members, representing a variety of academic disciplines including social sciences, engineering, medical sciences, education, natural sciences, and vocational studies.

Table 2. Demographic Information of Participants Interviewed

No	University	Gender	Age	Department	Title	Interview Type	Duration (min)
K1	Osmaniye Korkut Ata University	Male	37	Faculty of Economics and Administrative Sciences	Assoc. Prof. Dr.	Phone	15
K2	Çağ University	Female	55	Graduate School of Social Sciences	Assist. Prof. Dr.	Phone	8
K3	Çukurova University	Female	55	Faculty of Agriculture	Prof. Dr.	Phone	16
K4	Çukurova University	Female	60	YADİM	Prof. Dr.	Face-to-face	25
K5	Toros University	Male	59	Industrial Engineering	Assoc. Prof. Dr.	Phone	25
K6	Çukurova University	Male	37	Pozantı Vocational School	Assoc. Prof. Dr.	Face-to-face	20
K7	Osmaniye Korkut Ata University	Female	34	Faculty of Economics and Administrative Sciences	Assist. Prof. Dr.	Phone	16
K8	Mersin University	Female	49	Faculty of Medicine – Statistics	Prof. Dr.	Phone	20

K9	Çağ University	Female	41	Graduate School of Social Sciences	Assoc. Prof. Dr.	Face-to-face	28
K10	Çukurova University	Female	45	Faculty of Communication	Lecturer	Phone	19
K11	Çukurova University	Male	41	Abdi Sütçü Vocational School	Lecturer	Face-to-face	15
K12	Toros University	Male	51	Industrial Engineering	Lecturer	Phone	16
K13	Çukurova University	Female	45	Faculty of Science and Literature – Mathematics	Assoc. Prof. Dr.	Face-to-face	20
K14	Çukurova University	Male	38	Fisheries Faculty	Assoc. Prof. Dr.	Face-to-face	18
K15	Adana Alparslan Türkeş Science and Technology University	Male	31	French Department	Lecturer	Phone	16
K16	Çukurova University	Male	37	Industrial Engineering	Research Assistant	Phone	10
K17	Adana Alparslan Türkeş Science and Technology University	Female	45	English Language and Literature	Assoc. Prof. Dr.	Phone	15
K18	Çukurova University	Female	42	Imamoğlu Vocational School	Prof. Dr.	Phone	15
K19	Çukurova University	Female	50	Faculty of Medicine	Prof. Dr.	Face-to-face	20
K20	Çukurova University	Female	41	Faculty of Education, Educational Sciences – Guidance and Psychological Counseling	Assist. Prof. Dr.	Face-to-face	20
K21	Çukurova University	Male	56	Faculty of Medicine	Assoc. Prof. Dr.	Face-to-face	15
K22	Mersin University	Male	38	Faculty of Economics and Administrative Sciences	Assist. Prof. Dr.	Face-to-face	25

Source: Created by the author

The average age of participants was 45 years, signifying a professionally mature and experientially rich group capable of providing reflective insight into the implications of artificial intelligence within higher education. The universities represented in this study include both state and foundation institutions, thereby ensuring a cross-institutional perspective on AI usage and readiness.

The diversity in institutional type, academic rank (ranging from research assistants to full professors), and disciplinary focus reinforces the generalizability of findings within the regional higher education context. The interviews were conducted either face-to-face (45.5%) or via telephone (54.5%), with durations ranging from 8 to 28 minutes (mean = 18 minutes), yielding a total of 396 minutes of recorded discourse. This methodological plurality enhanced the richness, triangulation, and credibility of the qualitative data.

4.2. AI Literacy: Training Deficits and Self-Directed Learning

A significant proportion of participants (63.6%) reported a complete absence of formal training in artificial intelligence technologies, underscoring a critical institutional gap in AI-related professional development. The remaining 36.4% engaged with AI through informal avenues such as online courses, self-directed tutorials, or academic webinars. This asymmetry in access to structured knowledge underscores the uneven terrain of AI literacy within the regional academic ecosystem.

Despite this training gap, there was a consensus among participants that AI literacy should be an institutional priority. Participant K3 articulated the challenge succinctly: "I had to learn AI on my own. There was no university-level support or orientation." Such sentiments reflect broader systemic deficiencies in academic preparedness for AI integration.

4.3. Current Patterns of AI Utilization in Academia

An overwhelming majority (81.8%) of the academics surveyed reported active engagement with AI tools, including ChatGPT, Gemini, and Google Assistant. These tools were used across diverse pedagogical and research functions. Specifically:

- 68% utilized AI to generate or enhance course content (e.g., preparing lecture notes, designing assignments, developing learning modules),
- 54% for translation and summarization of academic texts,
- 45% for conducting literature reviews, drafting abstracts, or analyzing research data,
- 27% for applied disciplinary work (e.g., productivity consulting, HR analytics, quality control in technical fields).

The participants described AI as an essential part of their academic routines. For example, K2 stated: "I use it for lesson preparation, research, and writing—it's indispensable." Meanwhile, K22 emphasized its analytical utility: "I asked AI to draft the introduction to my thesis and used it to cross-verify statistical outputs."

4.4. Perceptions and Definitions of Artificial Intelligence

Analysis of conceptual codes related to AI perception revealed a functional orientation among most participants:

- 63.6% viewed AI as a practical tool that simplifies academic workload,
- 40.9% defined it as a digital assistant supporting educational efficiency,
- 27.2% characterized it as possessing quasi-human cognitive traits,
- 22.7% expressed apprehension about its potential misuse or ethical ambiguity.

Such responses indicate a prevailing pragmatic, albeit cautiously optimistic, approach to AI. Participants valued the convenience and efficiency it offered, yet remained vigilant about its unintended consequences.

4.5. Institutional Readiness and Policy Gaps

While individual adoption was high, participants unanimously reported a lack of institutional frameworks guiding AI integration. K10 observed, "There's no infrastructure here. Everything I do is self-initiated." Participant K12 added, "There are programs emerging, but no cohesive strategy."

Emergent subthemes included:

- Policy Vacuum: 17 references emphasized the absence of national or institutional regulatory frameworks.
- Awareness Deficits: 15 references highlighted the need for comprehensive training programs.
- Academic Engagement Challenges: 12 references cited the erosion of interpersonal pedagogical dynamics due to AI.
- Infrastructure Limitations: 11 references pointed to insufficient technological or administrative capacity.

K11 summarized these concerns: "Without legal and ethical guardrails, AI's academic use is risky." Such feedback underscores the urgent need for system-level policy design, including curriculum integration and administrative protocols.

4.6. Pedagogical Impact: Efficiency vs. Educational Depth

Participants discussed AI's dualistic educational effects. On the one hand, the technology was seen as a time-saving, workflow-optimizing asset; on the other, as a factor potentially undermining critical thinking and originality:

- Positive effects:
  - Increased time efficiency (68%),
  - Enhanced instructional planning and delivery (59%),
  - Support for interdisciplinary learning (36%).
- Negative effects:
  - Suppression of critical thinking skills (41%),
  - Compromised academic originality (45%),
  - Superficial learning practices (32%).

Participant K16 remarked, "AI helps, but students rely on it too much—it hampers deep engagement." This tension highlights the pedagogical paradox of AI: as a tool that can simultaneously enrich and dilute the learning process.

4.7. Practical Applications and Research Integration

Respondents shared numerous examples of their AI usage in academic practice:

- 12 participants used AI for drafting papers and conducting literature reviews,
- 9 employed it for visual content and presentations,
- 7 for multilingual translation and editing,
- 4 in scientific simulations or technical validations,

- 3 in creative and design-based applications.

Participant K14 reported, "We use AI in image processing to assess fish spoilage for quality control," illustrating the technology's utility in research-intensive disciplines. Others, like K20, voiced reservations due to reliability issues, e.g., "I asked ChatGPT, and it admitted the information was fabricated."

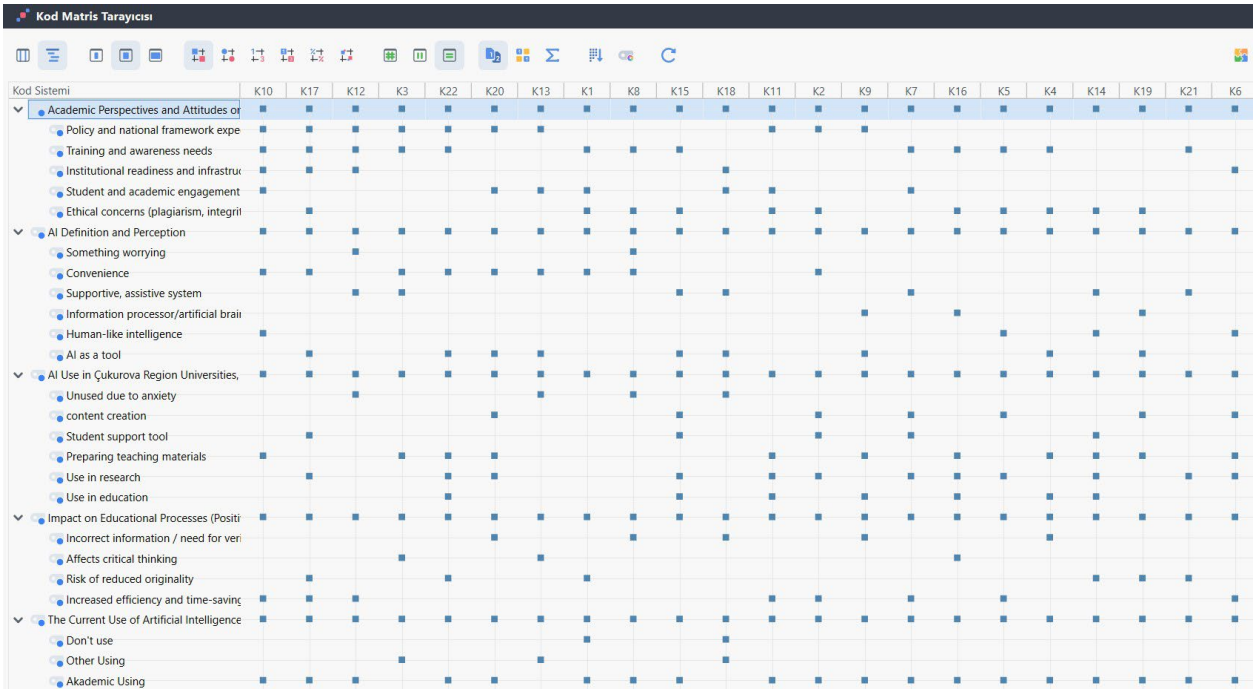

Figure 2. Main Theme and Subcodes Content Analysis Code Matrix Scanner

This MAXQDA code matrix systematically presents the themes with which the participants' (K1–K22) views on artificial intelligence overlap. Looking at the coding system in the figure, it can be seen that the subcodes policy and national framework expectations, training and awareness needs, institutional readiness and infrastructure, and student and academic engagement under the theme "Academic Perspectives and Attitudes on AI" were marked by many participants. This indicates that participants have a strong awareness of the need for artificial intelligence to be considered not only from a technological perspective but also from ethical, institutional, and pedagogical perspectives.

5. Discussion, Conclusions & Recommendations

This study offers a multi-faceted, experience-driven analysis of AI integration in higher education through insights from 22 academics across six universities in Türkiye's Çukurova Region. Our findings reveal that AI implementation remains largely ad hoc, shaped by individual academics rather than being embedded within institutional frameworks. This aligns with the explosion of AI research in 2021–2022, when publication rates nearly doubled or tripled compared to prior years, particularly in areas like learning analytics, curriculum sequencing, instructional design, and student clustering (Crompton & Burke, 2023).

Most of the people who took part said that AI tools like ChatGPT, Gemini, and Google Assistant were useful for things like editing content, gathering sources, developing projects, making exams, and designing presentations. This point of view is in line with Oladele (2024), who says that precision, scalability, and efficiency are some of the main benefits of AI in education. Renkema and Tursunbayeva (2024) and Dwivedi et al. (2023) also talk about how AI could change the way policies are made and research is done. Their main point is how generative conversational AI could change the way scientists work.AI Zahrani and Alasmari (2024) talk about how AI could make school more personal and keep students interested in the meantime. Even though these are good things, our participants learned more about the problems with using AI in education, like shallow learning, less originality, ethical issues, and data security. Some people said that AI might "solve problems without explaining" or even help students cheat on tests. These ideas support Dempere et al.'s (2023) concerns about how clear algorithms are, how safe data is, and how much less people talk to each other.

Even though these are good things, our participants learned more about the bad things about using AI in education, like shallow learning, less originality, ethical issues, and data security. Others said that AI might "solve problems without explaining" or even help students cheat on tests. These ideas support Dempere et al.'s (2023) concerns about how clear al-

gorithms are, how safe data is, and how much less people talk to each other.

These findings are similar to Thomas's (2023) work on vulnerabilities in data manipulation, Miller's (2023) focus on the erosion of critical thinking, and Royer's (2024) idea of AI's "bullshit" outputs and hallucinations—things he says should be faced with critical education, not naive trust. Royer does say that teachers should be facilitators of AI-skeptical inquiry, not pushed aside by technology. Instead, they should be empowered by it as mentors who help people think, reason creatively, and make moral decisions.

Also, the moral, social, and educational issues brought up by Al Zahrani & Alasmari (2024), Clune (2023), and Bayne (2015) make it clear that AI needs to be built into systems that value fair access, fair grading, student involvement, and long-term teaching. Popenici and Kerr's (2017) criticism of the hoopla around MOOCs makes it even more clear that we need to implement AI in a way that is more humanized and sustainable for institutions, rather than making changes right away that are driven by technology.

6. Conclusions

1. AI as a pragmatic tool: Academics predominantly utilize AI for its functional advantages, as noted by Oladele (2024) and Crompton & Burke (2023).
2. Critical awareness emerging: Participants are aware of the possible hazards of losing uniqueness, acting unethically, and AI hallucinations. This supports the findings of Dempere et al. (2023), Miller (2023), and Royer (2024).
3. Institutional gaps: The lack of clear rules, training, infrastructure, and ethical guidelines is a common problem, as shown by Al Zahrani & Alasmari (2024) and Hamedinasab & Rahimi (2025).

Collectively, these ideas emphasize that the incorporation of AI in higher education goes beyond simple technology adoption; it requires a fundamental transformation in pedagogy, ethics, and institutional alignment.

7. Recommendations

Aim	Strategic Intervention	Justification
Governance & Ethical Standards	Develop interdisciplinary guidelines emphasizing justice, transparency, security, and accountability (Oladele, 2024; Crompton & Burke, 2023). Integrate AI ethics into institutional policies and revise accreditation criteria (Popenici & Kerr, 2017; Clune, 2023).	To safeguard academic integrity and balance automation with human oversight.
Infrastructure & Technical Support	Invest in secure AI platforms, robust internet, data privacy, and technical support staff (Hamedinasab & Rahimi, 2025). Incorporate AI readiness into strategic planning and accreditation frameworks.	Ensures equitable and sustainable institutional adoption.
AI Literacy & Capacity Building	Launch AI training for both academics and students using workshops, online modules, and case-based learning (Doğan et al., 2025; Jose & Jose, 2024).	Aims to transform users into critically literate, ethically responsible agents.
Curricular Integration with Pedagogy	Embed AI into curricula with a focus on ethical use, critical thinking, creativity, and reflective learning (Vilarino, 2025; Royer, 2024). Humanities and social sciences should emphasize critical questioning over rote responses.	Strengthens pedagogical coherence and redefines the teacher's mentoring role.
Research & Evaluation Studies	Employ longitudinal and cross-cultural analyses focusing on attitudes, learning outcomes, equity, and ethical impacts (Chan & Hu, 2023; Milano, McGrane & Leonelli, 2023; Rasul et al., 2023).	To create nuanced, evidence-based implementation strategies.

8. Final Reflections

The advent of AI represents more than a technological shift—it heralds a pedagogical and epistemological metamorphosis within higher education. As Royer (2024) reminds us, the real challenge is not "handing over humanity to the machines," but reasserting the irreplaceable worth of human judgment, ethics, and creativity. By integrating AI thoughtfully—grounded in institutional readiness, pedagogical intention, and ethical deliberation—universities can transform this "education crisis" into an opportunity for re-emphasizing human-centric values in teaching, learning, and research.

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Research Article

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Reprogramming the Psychology of Success: The Reflections of Wearable Technologies in Athletes' Emotional and Motivational Dynamics[1]

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Abstract

This study explores how wearable technologies are integrated into athletes' emotional and motivational experiences through a qualitative approach grounded in the psychology of success. Interviews were conducted with professional athletes from various disciplines, and the data were categorized under five main themes: adoption of wearable technologies and initial motivations, training planning and habit formation through wearable technologies, the role of feedback in motivation and self-confidence, technological dependence and critical awareness, and future expectations and long-term motivation. The findings reveal that wearable devices go beyond merely tracking physiological data and play a role in enhancing self-awareness, self-discipline, self-esteem, and intrinsic motivation. Moreover, real-time data was found to support athletes' self-regulation skills, although potential risks such as technology addiction, data privacy concerns, and the over-quantification of self-perception were not sufficiently recognized. The study positions wearable technologies as significant digital companions that reshape athletes' psychology of success and offers an original contribution to the literature.

Keywords: Wearable Technologies, Professional Athletes, Motivation, Emotional Regulation, Success Psychology.

JEL Codes: J24, M10, M15

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1. Introduction

The documented history of sport extends over more than 3,000 years, evolving in parallel with the development of human civilization. Within this historical continuity, the first Olympic Games held in Ancient Greece in 776 BCE represent not merely a sporting event but a significant threshold where the systematic testing of individual physical capabilities and the institutionalization of societies' tendencies to valorize bodily competence emerged (Softić, Hundur, Spahić, Ašić & Pokvić, 2024).

Over time, however, sport has evolved beyond being a field where physical adequacy alone is displayed; it has transformed into a multi-layered phenomenon that integrates sociocultural, psychological, and technological components. In contemporary practice, athletic success is no longer solely rooted in physiological foundations but is increasingly shaped by the integration of mental processes, emotional flexibility, and self-regulatory skills. Accordingly, athletes who aspire to reach high-performance standards are expected to demonstrate advanced competencies not only in physical terms but also in cognitive and emotional functionality (MacNamara, Button, & Collins, 2010).

At the core of this transformation lies sport psychology—an interdisciplinary research field that systematically investigates how fundamental psychological processes such as attention, motivation, self-efficacy, emotional regulation, and self-perception influence athletic performance (Weinberg & Gould, 2018).

Although the use of scientific methods to enhance athletic performance has a long-standing history, these efforts often fell short due to methodological limitations and insufficient data. However, technological developments over the past decade and the widespread application of big data analytics in sports settings have laid the groundwork for a more systematic, objective, and measurable approach to performance science (Baca & Kornfeind, 2012).

The interaction between sport psychology and digital technologies has opened a new paradigm—one that enables not only the objective evaluation of performance through measurable parameters but also a deeper understanding of athletes' psychosocial development. Wearable technologies, AI-based analytical systems, and mobile data platforms have become psychotechnological components that monitor physiological outputs while simultaneously reshaping athletes' intrinsic motivation patterns, perceptions of self-efficacy, and subjective constructions of success (Grady, 2023; McCullagh, 2021).

This transformation has significantly contributed to optimizing training processes both in terms of quality and quantity (Softić et al., 2024). In this context, wearable technologies have emerged as critical instruments in the digital transformation of sport. Typically designed as accessories, garments, or devices worn on the body with wireless communication capabilities, these technologies enable real-time monitoring of key physiological parameters such as heart rate, pulse, respiration, and sleep quality (Chidambaram et al., 2022). Consequently, athletic performance can be evaluated in a more comprehensive and objective manner.

Moreover, these devices extend beyond passive data collection by utilizing AI-supported analyses to generate personalized performance profiles. As a result, real-time feedback mechanisms have evolved into behavioral stimuli that increase athletes' awareness of their physical limits and activate intrinsic motivation. For instance, notifications indicating the completion of daily training goals or in-app rewards can enhance the sense of achievement and support sustainable motivation (Scudds & Lasikiewicz, 2024).

The current literature predominantly focuses on the relationship between wearable technologies and physiological performance outputs (Li et al., 2016; James & Petrone, 2016; Adesida et al., 2019; Grady, 2023; da Silva, 2024; Yang, 2024). However, psychological processes are often treated as secondary concerns or overlooked entirely (McCullagh, 2021).

Addressing this gap, the present study is designed to explore the following central research question:

"How do wearable technologies reshape athletes' psychology of success and motivational patterns?". This study positions wearable technologies not merely as tools for monitoring physical performance but as digital companions that actively restructure athletes' psychology of achievement. In doing so, it aims to contribute an original perspective to the field of sport psychology. Employing qualitative research methods, this study draws upon semi-structured interviews conducted with professional athletes (n = 10) to investigate how they interpret their relationships with these technologies, how they develop self-regulatory motivational patterns, and how their sense of self is shaped in the process.

Within this framework, the study seeks to reveal the critical turning points where athletes shift from asking "How many steps did I take?" to asking "Which step helped me grow?" Furthermore, the study takes a multidimensional and critical stance by not only highlighting the advantages of wearable technologies but also addressing potential concerns related to emotional integrity, data privacy, and identity perception.

2. Conceptual Framework

This section outlines the fundamental concepts related to wearable technologies, athlete motivation, and the psychology of success.

2.1. Wearable Technologies in Sports

In recent years, there has been a significant increase in interest in monitoring individuals' physiological functions and performance data in real time within the fields of sports and health. This trend has led wearable and portable devices integrated with sensor technology to emerge as reliable tools in both scientific research and commercial applications. Although traditional optical motion analysis systems offer high accuracy, their use is limited to laboratory environments due to complex setups, making them unsuitable for field applications (Adesida, Papi & McGregor, 2019). In contrast, modern wearable devices have overcome the limitations of electrical signal-based monitoring, enabling the effective tracking of athletes' health status within natural training environments. As a result, these technologies have evolved beyond being mere measurement tools and have become strategic components accelerating the digital transformation of sports environments, particularly in terms of performance monitoring and health analytics (da Silva, 2024).

Wearable technologies have made performance management more accessible, practical, and personalized by enabling uninterrupted, real-time data tracking in natural training settings. Sensors such as pedometers, heart rate monitors, portable electrocardiogram (ECG) devices, and accelerometers have been designed for individual use and are effectively employed in various application areas. In line with growing public awareness of health and physical exercise habits, smartwatches, fitness bands, smart glasses, helmets, and smart garments provide users with instant access to physiological data, thus accelerating the transformation in this domain (Yang, 2024).

Internet of Things (IoT) technologies and wearable devices offer significant contributions to critical areas in sports such as enhancing athletic performance, ensuring safety, and improving fan engagement. Through sensor systems integrated with IoT, coaches can instantly access athletes' performance metrics and analyze opponents' weaknesses to gain strategic advantages. Additionally, embedded sensors and microchips enable the real-time monitoring of athletes' health, allowing sports physicians and physiotherapists to make well-informed decisions. This is particularly valuable in endurance events, where traditional training and competition methods fall short in developing athletic capabilities. For instance, completing endurance exercises such as long-distance running requires a high degree of willpower and psychological resilience (Raad, 2021).

2.2. Enhancing Athletic Performance Through Wearable Technologies

Athletes, particularly during preparation for high-risk sporting events, are exposed to intense mental and physical stress (Chidambaram et al., 2022). To achieve optimal sports performance, training programs must be structured in alignment with the specific demands of competition. The accurate analysis of physiological responses to high-intensity workloads is critical for understanding sport-specific requirements. In this context, wearable technologies enable the comprehensive monitoring of professional athletes throughout both training and competition processes. The ability to track internal load indicators—such as heart rate, lactate levels, oxygen consumption, and perceived exertion—alongside external load parameters—including running distance, speed, and acceleration—in real time allows for a holistic and objective assessment of training load (Şahin, 2021).

Moreover, wearable technologies facilitate not only the collection of physiological data but also behavioral and psychological metrics (e.g., anxiety, stress, and fatigue levels), enabling the comprehensive monitoring of athletes' emotional and motivational states. Artificial intelligence-supported systems analyze these multilayered datasets to contribute to the development of personalized performance strategies tailored to individual needs (Chidambaram et al., 2022).

One illustrative example of such technology is Adidas's miCoach system. This system helps manage training processes more effectively and reduces injury risk by tracking professional football players' heart rates and physical workload levels. Additionally, sensors embedded into athletes' garments collect and analyze critical data such as speed, direction, acceleration, and blood pressure, providing valuable insights for coaches and medical staff (Raad, 2021).

In summary, the ability to gather physiological data in dynamic, field-based environments—once limited to controlled laboratory settings—has transformed training management into a more informed, data-driven, and individualized practice. This transformation not only supports performance optimization but also enhances athletes' motivational processes (James & Petrone, 2016). In particular, the "marginal gains" approach—which suggests that incremental improvements in multiple domains can lead to significant overall advancement—has become increasingly applicable with the detailed data provided by wearable technologies (Migliaccio, Padula & Russo, 2024).

2.3. Wearable Technologies and the Psychological Dynamics of Success in Athletes

Athletes' perception of success is directly related to how they define it. This perception is a key psy-

chological variable that shapes their self-confidence, motivation, and capacity to focus on tasks. The psychology of success is a holistic approach aimed at understanding the internal and external dynamics that emerge during the process of realizing one's potential. This approach regards not only performance outcomes but also the athlete's goal-oriented development, task effort, and psychological resilience as indicators of success (Waitley, 2015).

According to Waitley's model, the core components of success include psychological factors such as self-awareness, self-discipline, intrinsic motivation, self-esteem, self-direction, positive thinking, and constructive relationships (Waitley, 2015). Figure 1 illustrates these components. Among them, this study focuses on four psychological variables with the highest potential to be supported by wearable technologies: self-awareness, self-discipline, self-esteem, and intrinsic motivation.

Figure 1. Core Components of Success
Source: (Waitley, 2015)

Self-awareness plays a critical role in skill development, the regulation of arousal levels, and emotional control, making it one of the fundamental elements of athletic performance (Chow & Luzzeri, 2019). Without awareness of their ideal performance state, athletes may not recognize the need for control in high-pressure situations. Wearable technologies offer athletes a rich source of data to monitor their own activities and exertion. McCormack et al. (2022) found that wearable devices significantly enhance awareness not only of activity levels but also of habits and inactivity.

Intrinsic motivation can be classified into two goal orientations: task/mastery orientation and ego/competition orientation. Task-oriented athletes value skill improvement and personal progress. They ask, 'Where did I improve?' or 'When was I most motivated?' Ego-oriented athletes evaluate success by comparison with others. Studies show that task-oriented goals produce more sustainable and positive outcomes. Coaches may not change athletes' motivations immediately, but can guide them using strategies that emphasize personal progress (Weinberg, 2009).

Self-esteem reflects a person's sense of adequacy, worth, and acceptance. In sports, it is linked to competence perception, satisfaction with performance, and coping strategies. Gotwals and Wayment's (2002) Sport-SSES study found strong links between athletes' self-perceived competence and their self-esteem. Athletes with high personal standards and less fear of failure tend to report higher self-esteem.

Self-discipline is essential for achieving elite performance, especially under pressure. Rapp and Tirabeni's (2020) qualitative study suggests that wearable technologies support the development of self-discipline in amateur athletes through reflection, scenario simulation, and learning from community-based experiences. Wearables also provide external motivation; however, to sustain intrinsic motivation, devices must align with the athlete's personal goals.

In this respect, wearable technologies emerge as powerful tools that support motivation toward success. Features such as real-time feedback, goal tracking, and gamification encourage sustainable motivation. For example, success journals that document personal progress enhance task orientation and promote long-term development.

Key contributions of wearable technologies to motivation (Scudds & Lasikiewicz, 2024):

- Goal tracking and feedback: Monitoring progress increases motivation.
- Gamification and competition: Social comparison activates extrinsic motivation.
- Self-monitoring and awareness: Real-time trac-

king promotes reflection and behavioral change.

When used appropriately, wearable technologies can increase motivation and encourage healthy habits. However, there are risks associated with the constant monitoring of emotional states and defining the self through quantitative data such as step counts or heart rate. As Turkle (2023) and Han (2023) note, quantitative metrics cannot capture the complexity of human experience or replace narrative-based self-understanding.

Additionally, factors such as data accuracy, user comfort, data privacy, and security remain key barriers to the wider adoption of these technologies. Protecting users' personal health information is especially crucial in AI-integrated systems. Continued research is necessary to improve data safety and usability. Further exploration of the psychological and motivational effects of wearable technologies will enable more informed and sustainable strategies for both professional and amateur athletes (Yang, 2024).

3. Research Methodology

In this study, a qualitative research methodology was adopted, with semi-structured interviews employed as the primary data collection method. As Creswell & Poth (2018) emphasize, qualitative research aims to provide an in-depth understanding of human behaviors, experiences, attitudes, beliefs, interactions among social groups, and broader societal dynamics. In line with the objectives of the study, a qualitative approach was deemed the most appropriate method, as it allowed for the collection of rich and detailed data concerning athletes' personal experiences and subjective motivational processes. Understanding how wearable technologies are perceived by athletes in the context of emotional and motivational dynamics necessitates the exploration of complex psychosocial processes that cannot be fully captured through quantitative measurements alone. Therefore, the study utilized semi-structured interviews to comprehensively examine individual perceptions, experiences, and meanings. Detailed information regarding the study's design is presented below.

3.1. Purpose of the Study

This study seeks to examine the influence of wearable technologies on athletes' emotional and motivational processes through the lens of achievement psychology. Within this framework, the primary objective of the study is to examine the multilayered experiences and meaning-making processes that emerge at the intersection of contemporary sport psychology and sports technologies. Based on the assumption that wearable technologies are not confined solely to monitoring physical performance, the research investigates how these technologies are interpreted by athletes within their subjective experiences, particularly in relation to psychological processes such as motivation, emotion regulation, and the perception of success. Accordingly, the study addresses the following research questions:

- What kind of experiences do athletes have regarding the motivational processes of wearable technologies?
- How do wearable technologies play a role in athletes' emotion regulation processes?

In the context of achievement psychology, what kind of meanings do athletes attribute to wearable technologies?

3.2. Study Group

The study group consists of professional athletes aged 18 and above who actively use wearable technologies in their training and performance processes. In line with the aim of exploring diverse experiences related to motivation, emotion regulation, and achievement psychology, attention was paid to including participants with varying demographic and athletic backgrounds. Factors such as age, gender, sport discipline, years of athletic experience, and duration of wearable technology use were considered to enrich the variety of perspectives obtained.

A total of 10 professional athletes were recruited for the study. Participants were selected using maximum variation sampling (Baltacı, 2018), ensuring diversity in terms of age, gender, sport discipline, athletic experience, and wearable technology usage duration. Although the target group was accessible, the number of interviews was determined based on the principle of data saturation, rather than convenience.

In line with Creswell's (2018) suggestion that 5 to 25 participants are typically sufficient for qualitative studies, the study continued interviews until it was observed that no new codes or themes were emerging in the final interviews. After the eighth interview, data began to repeat itself, and interviews nine and ten confirmed the existing thematic structure. Therefore, it was concluded that thematic saturation had been achieved, and the existing data set provided sufficient depth and richness to address the research questions.

3.3. Data Collection Method

In line with the literature review and the objectives of the study, an interview form was developed to explore athletes' lived experiences with wearable technologies in relation to motivation, emotion regulation, and achievement psychology. The form included questions regarding participants' demographic chara-

cteristics (e.g., age, gender, sport discipline, athletic background, and duration of wearable technology use), as well as 11 open-ended questions designed to encourage rich and detailed narratives.

All core questions were structured as open-ended to allow participants to freely express their experiences in their own words. Some questions included optional sub-questions or parenthetical examples, which were not presented directly during the interviews. Instead, these elements were used selectively by the interviewer only when participants' responses were insufficient or unclear, to support elaboration and encourage deeper reflection. This flexible approach ensured the collection of rich data without leading or constraining participants' narratives.

In qualitative research, the development of an interview form requires attention to question clarity, adaptability to participants' perspectives, and adherence to ethical guidelines (Patton, 2015). Accordingly, the questions were designed to be clear, reflective, and responsive to the lived meanings expressed by participants. The form aimed to elicit subjective accounts of wearable technologies and explore how athletes construct meaning in psychological contexts related to motivation, emotional regulation, and success (Bryman, 2016). Informed consent was obtained from all participants, and ethical standards, including confidentiality, were rigorously upheld throughout the data collection process (Creswell & Creswell, 2017).

The interview form, prepared within this framework, included the following open-ended questions:

1. What was the most significant factor that influenced your decision to start using wearable technology? Why did you choose to adopt it?

2. Which wearable device did you initially decide to use, and why did you choose that particular device? What were your expectations, and were they met?

3. In general, what innovations or changes do you believe wearable devices have brought to your sports and training routines?

4. During which periods or situations do you tend to use the technology more frequently (e.g., competition periods, intense training days)? Is there a specific reason for this?

5. Which features of the device (e.g., sleep tracking, heart rate monitoring, detailed training data) do you find most beneficial? Can you evaluate how these features influence your motivation?

6. How do goal achievement notifications provided by wearable devices (e.g., step count targets or heart rate goals) affect your motivation towards training?

7. Does the ability of the device to display your daily progress increase your desire to achieve personal goals? For example, how has this influenced your sporting habits?

8. Have you modified your training methods based on the data provided by the device? If so, what have been the effects of these changes?

9. If you were required to train without technology, how would this affect you? Would your motivation or performance change?

10. Do you believe that the positive or negative feedback provided by wearable devices has influenced your self-confidence? Has this feedback specifically affected your morale?

11. In your opinion, in which areas could wearable technologies become more effective for athletes in the future? What innovations do you think could contribute to motivation and performance?

3.4. Validity, Reliability, and Ethical Framework of the Study

In this study, methods recommended in the literature to enhance the validity and reliability of qualitative research were applied (Yıldırım, & Şimşek, 2021). To ensure internal validity, a draft version of the interview form was reviewed by subject matter experts. The relevance, clarity, and content adequacy of the questions were evaluated and revised based on expert feedback. The time and location of the interviews were determined according to participant preferences, and face-to-face interviews facilitated sufficient interaction. With participants' consent, the interviews were audio recorded and conducted between March 10, 2025, and April 15, 2025. The audio recordings were transcribed, and the transcripts were shared with the participants for verification. The documents approved by the participants confirmed that their views had been accurately and comprehensively represented.

To enhance the transferability of the findings, detailed descriptions of the participants and research context were provided, allowing readers to assess the relevance of the study to their own settings (Christensen et al., 2015). To strengthen the reliability of the research, all interviews were audio-recorded to ensure accurate documentation and prevent data loss. Furthermore, two researchers independently coded the qualitative data. Upon completion of the initial coding, the codes were compared, and any discrepancies were resolved through discussion. The final coding framework was developed collaboratively based on mutual evaluation. The findings were reported without personal interpretation by the researcher, using direct quotations that reflected the participants' perspectives. Participant confidentiality was maintained through data coding. Furthermore, the study adhered to the principles of scientific research ethics and was approved by the Non-Interventional Research Ethics Committee of Hitit University (approval number 2025-04, dated March 6, 2025).

3.5. Data Analysis Process

The data obtained in this study were analyzed using MAXQDA 2020 software. The analysis process was conducted in four main stages. First, participants' responses were examined in detail, and meaningful themes were identified through an inductive, data-driven approach. After the emergence of the thematic structure, codes were developed in alignment with relevant theoretical frameworks from the literature. Specifically, the coding process was guided by the theories of success psychology (Waitley, 2015), self-determination theory (Ryan & Deci, 2017), self-awareness (Chow & Luzzeri, 2019), self-discipline (Rapp & Tirabeni, 2020), and self-esteem (Gotwals & Wayment, 2002). The data were subsequently organized within a hierarchical structure of codes and themes, and the findings were presented with the support of tables and visual figures.

3.6. Research Findings

In order to uncover athletes' experiences with wearable technologies and their perspectives on these technologies in relation to motivation, emotion regulation, and achievement psychology, semi-structured interviews were conducted with a total of 10 participants from various sports disciplines. An analysis of the participants' demographic characteristics revealed that the majority were male (70%), their ages ranged from 22 to 50, and a significant proportion (60%) were over the age of 28. Most participants had more than eight years of athletic experience (70%), and they had been using wearable technologies for an average of five years. Among the participants, 40% held national or international rankings in their respective sports, including achievements in Turkish, European, and/or Balkan competitions. The sports disciplines represented among the participants included swimming, darts, volleyball, gymnastics, weightlifting, running, and wrestling. Additionally, 30% of the participants were coaches.

A detailed analysis of the interviews led to the identification of five main themes, with corresponding subcodes developed based on the codes derived from the data. The results of the analysis—including code trees related to the themes and codes, along with representative participant statements—are presented in this section.

3.7. Themes Based on Athletes' Perceptions of Wearable Technologies in Relation to Motivation, Emotion Regulation, and Achievement Psychology

The themes identified based on the frequency of use of the data obtained from the interviews are summarized in Figure 2.

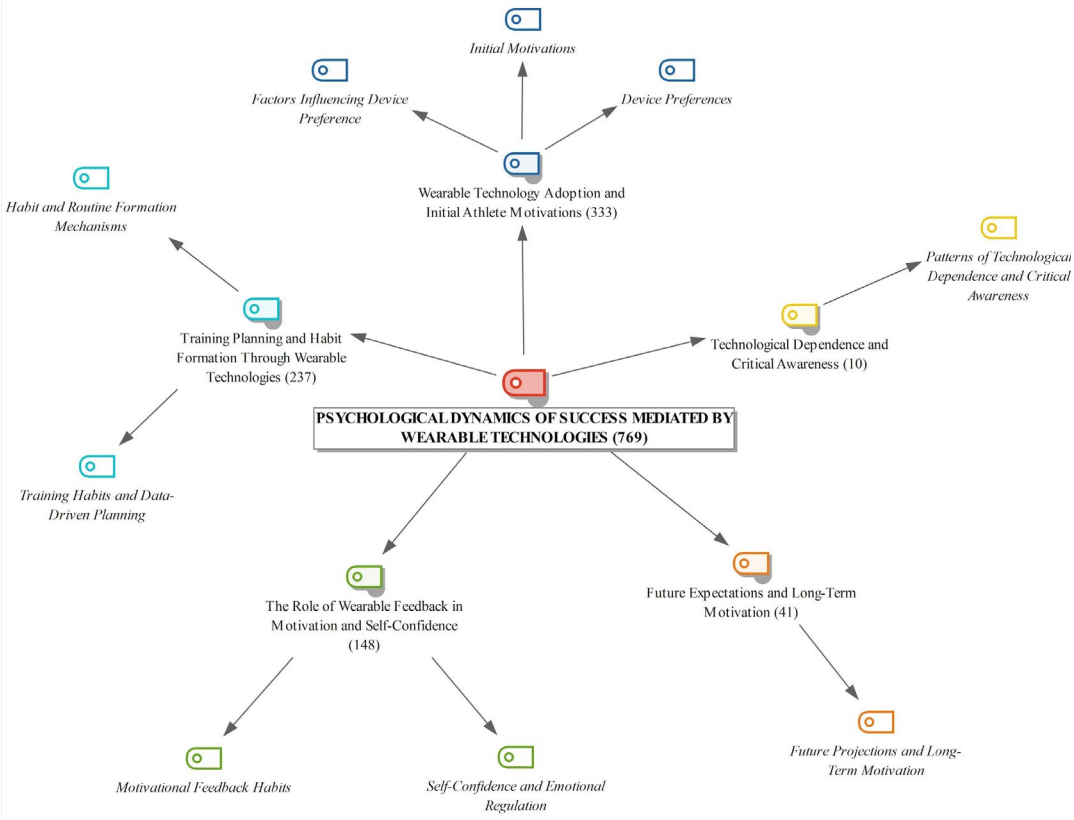

Figure 2. Themes Based on Athletes' Perceptions of Wearable Technologies in Relation to Motivation, Emotion Regulation, and Achievement Psychology

Five themes were identified based on athletes' perceptions of wearable technologies in relation to motivation, emotion regulation, and achievement psychology. These themes were titled as follows: wearable technology adoption and initial athlete motivations, training planning and habit formation through wearable technologies, the role of feedback from wearable technologies in motivation and self-confidence, technological dependence and critical awareness, and future expectations and long-term motivation. The numbers shown alongside the themes in Figure 1 indicate the frequency of coding for each theme based on participants' responses. A total of 769 meaningful statements were identified. These statements primarily focused on the themes wearable technology adoption and initial athlete motivations (333) and training planning and habit formation through wearable technologies (237). The fewest statements were coded under the theme technological dependence and critical awareness (10).

3.8. Code Trees and Participant Statements Related to the Main Themes

In this section, the code trees developed for the five main themes, along with participant statements supporting these themes, are presented.

3.8.1. Wearable technology adoption and initial athlete motivations

The first prominent theme derived from participant interviews was titled Wearable Technology Adoption and Initial Athlete Motivations. This theme encapsulates the reasons athletes began using wearable devices, along with their preferences for specific technologies. Three sub-codes were identified under this theme: Device Preferences, Initial Motivations, and Factors Influencing Device Preference. Among these, "Factors Influencing Device Preference" emerged as the most frequently emphasized, whereas "Device Preferences" was the least discussed.

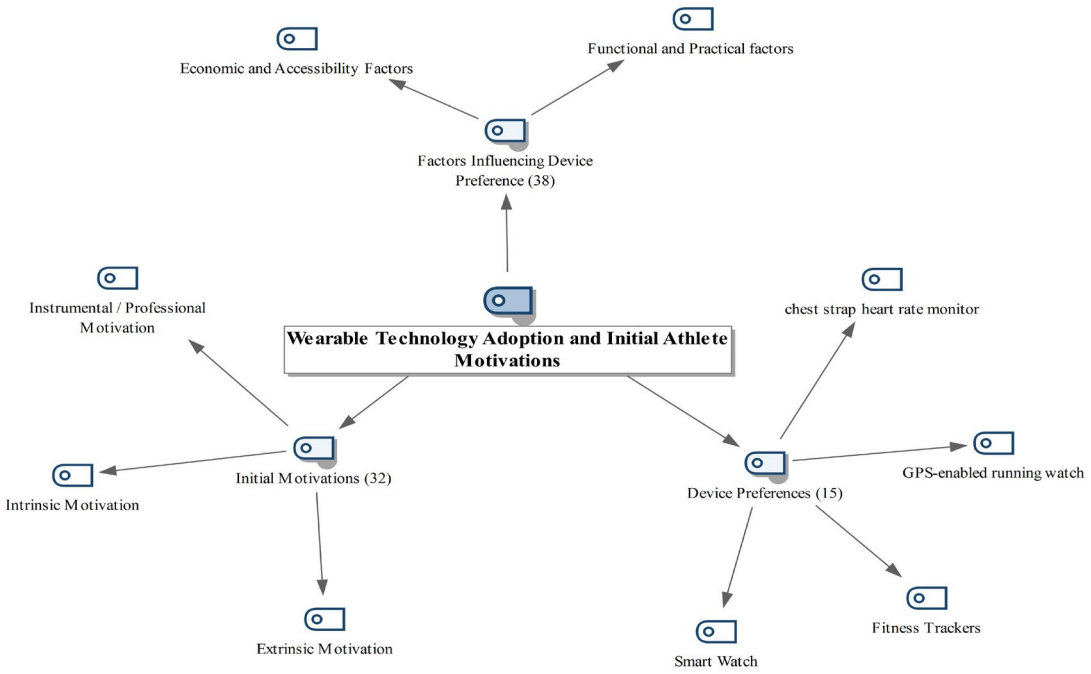

Figure 3. Codes and Participant Statements Related to the Theme "Wearable Technology Adoption and Initial Athlete Motivations"Achievement Psychology

Participants' initial motivations for adopting wearable technologies were grouped into three main categories: intrinsic, extrinsic, and professional (instrumental) motivations.

Under intrinsic motivations, many participants stated that they adopted wearable technologies to monitor their health, improve their physical performance, manage weight, and establish personal routines and self-discipline. A recurring theme was the desire to track and control one's own progress. As one participant expressed:

> *"Being able to monitor my health... My reason for choosing it was to track my health and fitness." (K1)*

This sentiment was echoed by several others (K2, K3, K4, K9), emphasizing self-monitoring as a key motivational driver. In terms of extrinsic motivations, participants frequently cited social influences, such as peer recommendations and social media advertising. For example, one participant noted:

> *"I started using it based on a friend's recommendation." (K2)*

Such statements highlight the impact of external social and media-driven stimuli in prompting initial use. Professional motivations were also influential for some, particularly those engaged in structured physical activities or training with specific performance goals. Participants in this category empha-

sized time management, staying connected during workouts, or fulfilling professional obligations. As one participant explained:

> *"My involvement in sports activities has mostly been focused on weight loss and staying fit." (K1)*

Similar motivations were shared by others (K4, K7), reinforcing the goal-oriented use of technology.

In line with these motivations, most participants indicated that the first wearable device they adopted was a smartwatch. This trend was observed across a wide range of participants (K1, K3, K4, K5, K6, K7, K9). As one of them stated:

> *"I first started using an iWatch." (K1)*

Others, however, initially preferred different types of devices, including fitness trackers, GPS-enabled running watches, and chest strap heart rate monitors. For instance:

> *"At first, I decided to use this smart bracelet." (K1, K2, K7)*

> *"It was a running watch with advanced GPS features." (K8)*

> *"Initially, a heart rate monitor belt." (K6)*

The factors influencing device preference were broadly categorized into two groups: functional and practical factors and economic and accessibility considerations. Functional features were clearly prioritized, especially those that provided direct benefits to athletic performance. Participants frequently mentioned tools for tracking calories, steps, distance, heart rate, pace, muscle fatigue, and biometric performance indicators. They also valued GPS functionality, ease of use, and support for planning routines. One participant detailed their use as follows:

> *"During periods when I felt I was overtraining, I used the data to extend my rest time and reduce the risk of injury. The blood oxygen level and VO2max values were indicators I consistently monitored. The features I found most useful were the step counter and heart rate monitoring. I also kept track of the maximum calories I burned and monitored muscle fatigue." (K1)*

Similar usage patterns and priorities were reflected across nearly all participants (K1–K9), underscoring the centrality of functionality. In contrast, some participants emphasized economic and accessibility constraints as barriers to adoption or as factors in their purchasing decisions. Price sensitivity and the perceived affordability of devices were commonly cited. As one participant explained:

> *"It was both simple and affordable... The price of the devices is a negative factor for me. If accessibility improves, more athletes could use these products and enhance their sports performance." (K5, K9)*

3.8.2. Training planning and habit formation through wearable technologies

The second prominent theme identified from participants' accounts was titled Training Planning and Habit Formation Through Wearable Technologies. This theme addresses athletes' approaches to structuring their training using wearable technologies, as well as the mechanisms through which they develop and maintain consistent exercise habits. The sub-codes associated with this theme Training Habits and Data-Driven Planning and Habit and Routine Formation Mechanisms are presented in Figure 4.

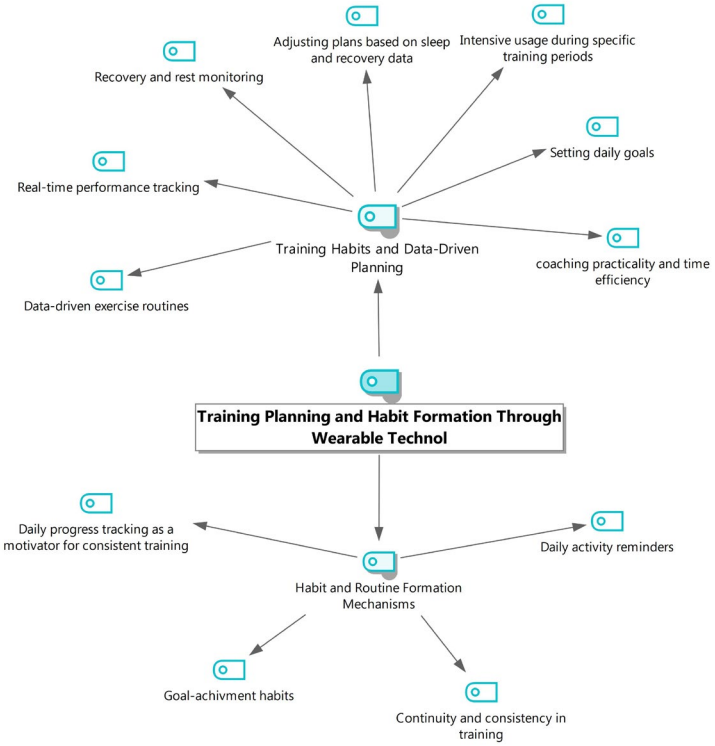

Figure 4. Codes and Participant Statements Related to the Theme "Training Planning and Habit Formation Through Wearable Technologies"

Analysis of participant statements underscored the significant role of wearable technologies in fostering data-informed training habits. Devices were widely described as tools that facilitated real-time performance monitoring, allowing athletes to continuously evaluate key variables such as form deterioration, recovery status, sleep quality, and training load. As one participant explained,

> *"It was the idea of monitoring athlete performance in real time and keeping a record of the data... Gymnastics requires a lot of detail and technique; even a slight loss of form or conditioning can affect outcomes... Providing data such as sleep quality was also important." (K5, K6, K7, K8, K9)*

Such insights reflect how real-time feedback became essential for self-regulation and technical precision in athletic contexts. Closely linked to this was the monitoring of recovery and rest patterns, which participants reported using to avoid overtraining and to calibrate the intensity of their sessions. By analyzing their own recovery data, athletes were able to manage fatigue more effectively and improve sleep hygiene. As K1 remarked:

> *"This makes it easier for me to avoid improper loading or excessive fatigue... By tracking my sleep, I improve its quality and maintain a more regular sleep pattern." (K1, K4, K5, K6, K7, K8)*

Similarly, adjusting training plans based on daily physiological insights emerged as a frequent strategy. For example, recovery metrics were used to inform day-to-day decisions about intensity and rest. As K5 noted:

> *"These data tell me things like, 'Okay, you're not at your best today, work a bit more gently,' or 'You're doing great today, you can push your limits,' which positively influences my motivation." (K5, K6, K7, K8, K9)*

Athletes also emphasized that their use of wearable technologies tended to intensify during specific training periods, such as competitive seasons or intensive camp schedules. As one participant described:

> *"In my weekly summary, I try not to let my activity level drop below a certain threshold whenever possible... I tend to use it more frequently during intense training days and periods when I'm working with specific goals." (K1–K8)*

Additionally, several participants described the coaching practicality and time-saving functions of these devices particularly among those who also served as coaches. Wearable technologies supported dual roles by streamlining data collection and improving session efficiency. One such coach-athlete shared:

> *"While coaching, I prefer using its stopwatch feature for a more practical approach. It helps me better understand both my own performance and the condition of my athletes." (K3, K4, K5, K6)*

Across multiple accounts, athletes highlighted the benefit of structuring data-driven exercise routines, which they described as offering a more scientific and objective alternative to intuitive or experience-based planning. For instance, K5 noted:

> *"It helped me use my time more efficiently during sports and training... I thought I could base my workouts on more scientific foundations, which led me to adopt a data-driven approach." (K3, K5, K6, K7, K8, K9)*

This scientific framing contributed to perceptions of credibility and precision in performance enhancement.

Under the second sub-code Habit and Routine Formation Mechanisms participants described how wearable technologies supported sustainable training routines. The ability to set daily goals was cited as a key behavioral anchor. These goals served not only as performance benchmarks but also as motivational tools. For instance, a long-distance runner explained:

> *"I define my daily goals more clearly. Having precise numerical values helps me set my goals more effectively. In long-distance running, managing weekly mileage, tempo workouts, and rest periods with fine adjustments is very important." (K1, K4, K6, K7, K8)*

Participants also valued daily progress tracking and the psychological reinforcement offered through small, reward-based achievements. This was reported to enhance consistency and discipline in training behavior:

> *"The system motivates you by offering small rewards... As long as you don't become obsessed with it and feel like you must keep moving or constantly collect rewards, these small incentives are actually quite effective." (K1–K9)*

Several participants shared that this regular feedback helped cultivate goal-achievement habits, giving them better insight into their performance levels and whether daily objectives were met. As K2 noted:

> *"In the past, on some days, I wasn't sure if I had trained enough. Now, when I see the data, I can more easily tell whether I've met my goals or fallen short. It has helped me become more goal-oriented in my sports and training routines." (K1, K2, K5, K7, K8, K9)*

Additionally, daily activity reminders were highlighted as simple yet powerful prompts that encouraged regular movement and discouraged sedentary behavior. K5 described how even minor notifications could serve as motivational nudges:

> *"When goal notifications appear, thoughts like 'Almost there, come on, move a bit more!' help me motivate myself." (K5)*

Finally, the continuity and consistency offered by wearable technologies were seen as fundamental to

long-term training success. Participants emphasized that sustained access to structured, personalized data enabled them to adopt a more disciplined and sustainable approach to physical activity:

> *"It had a positive effect on my sports habits because reaching small daily goals helped me train more regularly." (K1, K2, K3, K6, K8)*

The role of feedback from wearable technologies in motivation and self-confidence

The third key theme emerging from participant interviews was titled The Role of Feedback from Wearable Technologies in Motivation and Self-Confidence. This theme explores how feedback obtained through wearable technologies influenced athletes' motivational dynamics and contributed to the development of self-confidence throughout their training journeys. The sub-codes associated with this theme are presented in Figure 5.

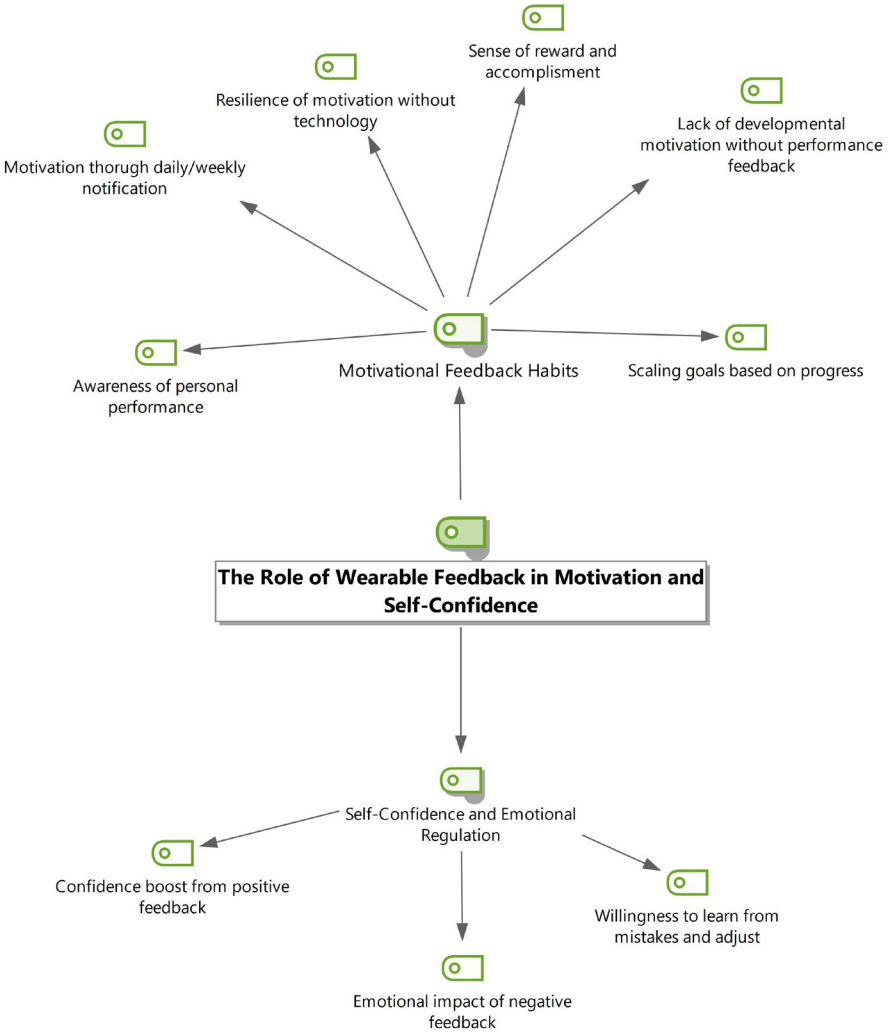

Figure 5. Codes and Participant Statements Related to the Theme "The Role of Feedback from wearable technologies in Motivation and Self-Confidence"

Participants consistently emphasized the importance of feedback as a motivational driver, particularly in sustaining consistent training behavior. Many athletes reported a significant decrease in developmental motivation when performance data was unavailable or insufficient. In these situations, they described feeling as if they were training blindly. For instance, one participant reflected:

> *"I would definitely feel more 'uncertain'... It would be like training blindly. In terms of motivation, since I wouldn't have any retrospective data, I might worry, thinking, 'What if I'm not on the right track right now?'" (K4, K5, K6, K7)*

The absence of data appeared to disrupt motivation and confidence in the training process. In contrast, other participants expressed a high degree of resilience in maintaining motivation without technological input, suggesting they could uphold goal-oriented routines independently. As one noted:

> *"If I couldn't easily determine whether I had reached my goal, I would continue with the same training... There wouldn't be a significant drop in my motivation because I would still have a goal." (K3–K9)*

Despite these differences, performance-based notifications—especially those received daily or we-

ekly—were widely perceived as powerful tools for maintaining motivation. These alerts served both as reminders of ongoing goals and as reinforcers of progress. For example:

> *"Measuring my performance helped me increase my motivation and work in a more goal-oriented way... I always strive to maintain a certain level." (K1, K2, K5–K8)*

Additionally, participants described a strong sense of reward and accomplishment upon receiving success notifications. These small victories were likened to personal competitions, which significantly boosted intrinsic motivation. As one athlete explained:

> *"The alert saying 'You have reached 80% of your weekly training goal' gives me a sense of completion. Trying to meet daily goals feels like small competitions for me. I feel as if I'm engaging in little contests with myself." (K1, K5–K8)*

Several participants further described how scaling goals in accordance with observed progress reinforced their motivation and commitment to long-term objectives. They noted that setting increasingly challenging targets helped them visualize growth more clearly. One participant shared:

> *"Feeling successful and seeing my progress encourages me to put in more effort... Engaging in challenges provides strong motivation for me to push beyond what I've already accomplished." (K1, K2, K4, K6)*

Moreover, feedback was reported to increase awareness of personal performance, prompting more deliberate and informed training decisions. Athletes explained that by reviewing their data, they developed greater attentiveness and training discipline. As articulated by one:

> *"It helped me become more attentive and increased my awareness. It contributed to performing more conscious training. It also boosted my motivation to do more and led me to improve myself further every day." (K1, K3–K6, K8, K9)*

In terms of self-confidence and emotional regulation, participants indicated that positive feedback not only supported performance improvement but also elevated their confidence levels. Receiving achievement-based notifications after reaching training targets strengthened their belief in their capabilities. As several participants noted:

> *"The achievement notifications I receive from the devices significantly boost my motivation... Feeling successful and seeing my progress encourage me to put in even more effort." (K1–K9)*

However, the emotional impact of negative feedback was also acknowledged. While falling short of goals or receiving poor-performance alerts occasionally led to disappointment, most participants described using such feedback constructively. One athlete recounted:

> *"If my rest quality has declined or I haven't met my goal, it can be a bit discouraging. However, I take it as a warning signal and see it as an opportunity to quickly correct my mistakes or shortcomings... For instance, when I get a notification like 'Your sleep quality is low, you might struggle today,' I view it as a proactive warning and adjust my training plan accordingly." (K3–K8)*

This perspective was often associated with a willingness to learn from mistakes and make adjustments, reflecting a growth-oriented approach to self-improvement. Feedback provided clarity on areas of weakness and allowed for strategic modification of training behaviors. As K6 observed:

> *"In some workouts where I thought I was performing efficiently, by checking my calorie burn and heart rate, I realized there were areas I had underperformed and corrected those sessions accordingly. In the past, I would roughly evaluate my runs by thinking, 'Today went well' or 'That didn't work at all.' But now, by reviewing the charts, I can clearly see which days I performed better and which days I was more fatigued." (K2, K4, K6–K8)*

Overall, the findings suggest that feedback from wearable technologies plays a multifaceted role—not only in strengthening motivation and refining training behaviors but also in cultivating emotional resilience, enhancing self-awareness, and facilitating adaptive performance strategies.

3.8.3. Technological dependence and critical awareness

The fourth major theme identified from participant narratives was titled Technological Dependence and Critical Awareness. This theme explores the nuanced relationship athletes have with wearable technologies, focusing on their perceived reliance on such devices and their ability to reflect critically on that reliance. The sub-code Patterns of Technological Dependence and Critical Awareness structures this theme, as presented in Figure 6.

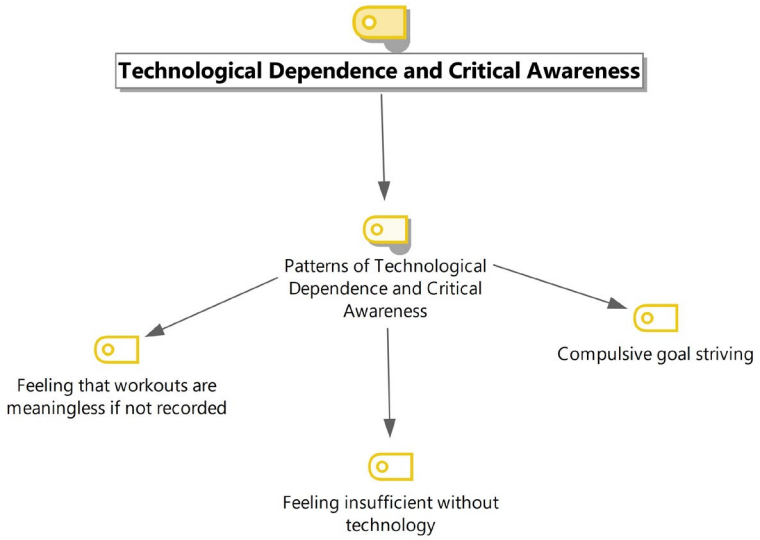

Figure 6. Codes and Participant Statements Related to the Theme "Technological Dependence and Critical Awareness"

Participants offered varied perspectives on the psychological and behavioral consequences of continuous wearable technology use. One of the most frequently expressed experiences was the perception that workouts lacked meaning or value if they were not digitally recorded. Several athletes described feeling that the absence of data disrupted their sense of completion or validation after exercise. For instance, one participant reflected:

> *"Actually, when I first started sports, technological devices weren't as common. Back then, I used to train based on instincts and my coach's observations. Now that I'm used to technology, running without it might feel like losing a part of myself." (K1, K7)*

This sentiment illustrates how digital tracking has become embedded in participants' routines to the point of shaping their subjective experience of physical activity. Closely related to this, participants expressed a growing sense of insufficiency or incompleteness when devices were unavailable. In some cases, the inability to monitor progress or log activity was experienced as demotivating, even irrationally so. As one athlete explained:

> *"There were even times when I felt, irrationally, as if I hadn't burned any calories if the activity wasn't recorded... Training without the device would lower my motivation because I wouldn't be able to track my progress, and reaching goals would become more difficult." (K1, K2)*

This reflection highlights how performance data had become central not only to tracking outcomes but also to validating effort and maintaining motivation. Perhaps most strikingly, one participant shared a case of compulsive goal striving, where the continuous loop of feedback, goals, and reward cues led to obsessive behaviors. In this case, the pursuit of digital milestones transitioned into an unhealthy fixation with productivity and self-optimization:

> *"I had started to develop an exercise addiction — that's a fact. Hitting daily goals and maintaining the streak by closing all the activity rings became an obsession, which led me to work out 3 to 3.5 hours every day... Being constantly exposed to data about yourself can also make you overly fixated on yourself." (K1)*

This admission reveals a critical tension in wearable technology use—where a tool initially intended to support health and motivation may inadvertently encourage overtraining, self-comparison, and obsessive self-monitoring.

Overall, this theme captures a spectrum of participant experiences, ranging from subtle reliance to overt dependence on digital tracking tools. While most athletes acknowledged the functional benefits of wearable technologies, they also demonstrated growing critical awareness of the psychological dependencies that might emerge from prolonged use. This reflective dimension adds depth to the broader analysis, emphasizing not just how wearable technologies shape training practices, but also how they intersect with athletes' mental frameworks, self-regulation strategies, and identity formation.

3.8.4. Future expectations and long-term motivation

The fifth major theme derived from participant interviews was titled Future Expectations and Long-Term Motivation. This theme examines athletes' forward-looking perspectives on wearable technology and their projections regarding how such technologies may influence long-term motivation and performance outcomes. The sub-code associated with this theme is presented in Figure 7.

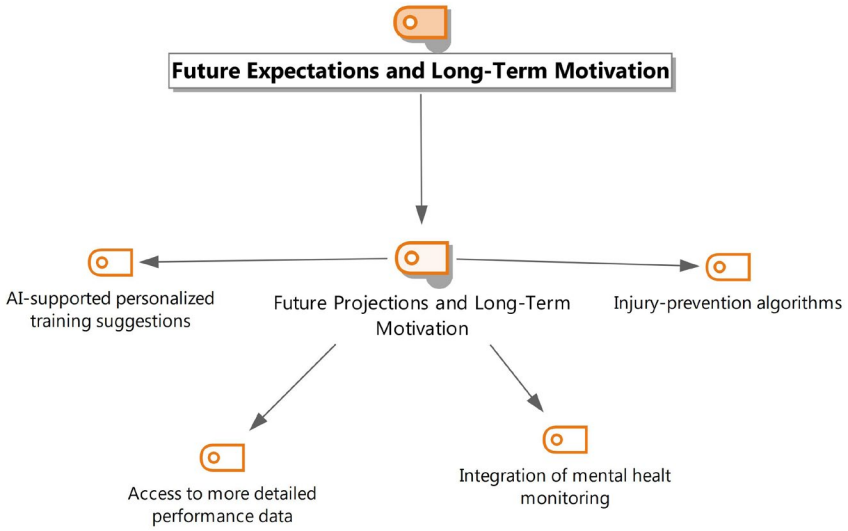

Figure 7. Codes and Participant Statements Related to the Theme "Future Expectations and Long-Term Motivation"

Participants conveyed optimistic and reflective insights about the future development of wearable technologies. A recurring theme in their projections was the belief that access to more detailed and precise performance data would significantly enhance both the efficiency of training and the sustainability of motivation. One participant noted:

> *"It can increase efficiency during training. As wearable technology advances, it will provide athletes with more detailed information, which will lead to increases in both motivation and performance." (K3, K30)*

This perspective underscores the idea that richer, more granular data could help athletes better understand and optimize their training efforts over time. A particularly salient future expectation involved the integration of artificial intelligence into wearable technologies to generate personalized training programs. Several participants envisioned systems that would adapt dynamically to individual performance profiles and physiological markers. K2 highlighted this vision, stating:

> *"Measurements related to mental training and stress management will also become more common. They will integrate with AI-based solutions to offer personalized training programs." (K2, K3, K5, K7, K8, K9)*

This view reflects a growing anticipation that AI-supported recommendations could make training more tailored, strategic, and scientifically grounded. In addition to performance tracking, participants emphasized the importance of mental health monitoring as a future component of wearable technology. Athletes expressed that real-time monitoring of psychological variables—such as stress, fatigue, or mental resilience—could serve both preventive and motivational purposes. One participant explained:

> *"In the future, these devices could provide more precise data for athletes and personalize training sessions. For example, data such as step counts and body temperature could help create more efficient training plans... When athletes approach exhaustion during workouts, this technology could offer notifications or motivation, providing immediate support and helping them push themselves further." (K1, K2, K4, K6, K8)*

This outlook frames wearable devices not only as physical performance tools, but also as instruments for holistic athlete development, encompassing both the physical and psychological dimensions of training. Another frequently cited projection was the future use of injury-prevention algorithms, particularly relevant for high-impact or endurance sports. Participants suggested that real-time biomechanical analysis could play a crucial role in preventing long-term injuries. As one long-distance runner stated:

> *"For long-distance runners especially, injury risk analysis and running technique monitoring technologies will be important for maintaining motivation. Correcting improper foot strikes or imbalanced running form through real-time alerts could play a crucial role." (K5, K7, K8)*

This insight reflects a future-oriented interest in preserving athlete well-being and ensuring the continuity of training by minimizing physical setbacks.

Taken together, the findings within this theme reveal that participants view wearable technologies not merely as tools for present-day performance enhancement, but as evolving systems with the potential to transform long-term training strategy, injury resilience, mental well-being, and personalized athlete support. The aspirational nature of these insights suggests a high level of technological literacy and expectation among the participants, coupled with a strategic mindset oriented toward sustained athletic growth.

4. Discussion and Conclusion

This study was conducted with the aim of qualitatively examining the impact of wearable technologies on athletes' emotional and motivational processes within the context of achievement psychology. The findings indicate that these technologies function not merely as tools for physiological monitoring, but also as digital companions that support athletes' psychological capacities such as self-regulation, intrinsic motivation, self-awareness, self-discipline, and self-esteem. In this respect, the study offers an original contribution by revealing how key psychological components of success are reshaped and reinforced through technological mediation. Participants frequently described wearable technologies as "development partners," emphasizing their role in structuring consistent training routines, enabling goal tracking, and making progress visible. These outcomes are in line with Self-Determination Theory (Ryan & Deci, 2017), which posits that fulfillment of the needs for competence, autonomy, and relatedness strengthens intrinsic motivation. The experiences reported by participants demonstrate that data-driven decision-making processes not only improve physical performance but also enhance athletes' psychological self-regulation capacities.

The data obtained through these technologies increased athletes' self-awareness by fostering insights into stress levels, fatigue, sleep quality, and training intensity. This aligns with Chow and Luzzeri (2019), who emphasize the importance of self-awareness for emotional regulation and performance control. The quantification of such parameters enabled athletes to manage their mind–body connection more consciously and cultivate greater mental flexibility. Most participants noted that practices such as setting daily goals, receiving regular reminders, and engaging with real-time feedback were instrumental in developing self-discipline. This finding is consistent with Rapp and Tirabeni's (2020) research, which highlights the role of wearable technologies in reinforcing discipline through habit formation and self-monitoring. While these technologies may offer extrinsic prompts, their alignment with athletes' personal goals helps sustain intrinsic motivation and behavioral consistency.

Self-esteem was also strengthened through feedback mechanisms that recognized success and progress. Athletes reported that even small achievements, when acknowledged through feedback, increased their sense of competence and reinforced self-confidence. These outcomes are in accordance with Gotwals and Wayment's (2002) findings on the relationship between perceived competence and self-esteem in sports contexts. Conversely, some participants stated that negative feedback could occasionally result in demotivation. However, many interpreted such experiences as learning opportunities and demonstrated a growth mindset (Dweck, 2006), using setbacks as occasions for adaptation and improvement.

A few participants reported that training without data tracking felt meaningless, suggesting a tendency toward technological dependence. This resonates with Turkle's (2023) and Han's (2023) critiques of digital selfhood and the reduction of subjective experience to quantifiable metrics. While the majority of participants remained focused on the practical benefits of technology, there was limited reflection on potential psychological costs, such as emotional externalization or overreliance on performance data. This finding echoes the broader literature on "technological optimism," where anticipated benefits overshadow critical engagement with potential risks.

Looking ahead, participants expressed expectations for more advanced wearable technologies, including AI-powered personalized training recommendations, psychological resilience tracking, and holistic performance analytics. These expectations are aligned with current developments in sports technology literature, which increasingly emphasize integrated psychophysiological support (Grady, 2023; Yang, 2024). Accordingly, the study not only captures current experiences but also reflects emerging trends in athlete–technology interaction.

Taken together, the findings demonstrate that wearable technologies contribute meaningfully to athletes' psychology of success across four key psychological domains: self-awareness, self-discipline, self-esteem, and intrinsic motivation. However, the sustainability of this contribution depends on athletes' ability to use these tools consciously, reflectively, and in balance with internal motivational structures. It is therefore essential that athletes avoid neglecting their internal processes in favor of external data; coaches and sport psychologists must design support systems that consider both performance metrics and emotional well-being. From the perspective of developers, integrating features that support psychological processes—such as self-awareness journals, mood tracking, and narrative-based progress reports—constitutes both an ethical and functional imperative. Such a holistic approach ensures that the influence of technology on athletic development is not only measurable but also meaningful and enduring.

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Research Article

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Green Office Practices: Sustainability Approaches in Office Management[1]

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Abstract

The purpose of this research is to examine the awareness, perception, and experiences of the faculty members working in the Office Services and Secretarial Department in Türkiye regarding green office applications. In the study, the faculty members' perspectives on the concept of green office, the place of green office applications in education, their application experiences, and their views on the future were investigated. The research was conducted with the phenomenology design, one of the qualitative research designs, and a structured interview form was used as the data collection tool. The study group consists of faculty members who have been working for five years. The data were analyzed using the content analysis method, two researchers were asked to theme the data to ensure reliability, and the agreement percentage (89%, 91%) was calculated. According to the research results, green office applications are addressed in the context of environmental and economic sustainability, and the emphasis on social sustainability remains limited. Green office applications, which are associated with functions such as efficiency in resource use, environmental awareness, and corporate responsibility, are not given sufficient space in education programs, and there is a lack of systematic information. In this context, the research makes an original contribution to the field with suggestions regarding sustainability-oriented regulations in office management education and its adaptation to vocational education.

Keywords: Green Office Practices, Office Management, Sustainability.

JEL Codes: Q56, Q01, M14.

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1. Introduction

The concept of sustainability came to the fore with the definition of sustainable development by the World Commission on Environment and Development in 1987 (Hopwood, Mellor, & O'Brien, 2005). The definition of sustainable development by the World Commission on Environment and Development is "a form of development that meets the needs of present generations without compromising the ability of future generations to meet their own needs" (WCED, 1987). This form of development covers many different areas, such as education, culture, and technology, within the scope of environmental, economic, and social sustainability (United Nations Educational, Scientific and Cultural Organization, 2024; Sachs, 2015). With the 21st century, sustainability has become a multifaceted and comprehensive concept with its environmental, economic, and social dimensions. The green office stands out as one of the applications that contribute to sustainability.

Environmental sustainability covers sustainable development actions, policies, and strategies that aim to control environmental impacts or conserve resources by reducing carbon emissions, minimizing waste, and protecting environmental resources, such as water, etc., and the ecosystem (Tennakoon, Janadari, & Wattuhewa, 2024). Green office practices such as energy saving, waste management, and carbon emission control serve the purpose of environmental sustainability and increase efficiency. At this point, the scope of green office practices is determined by environmental sustainability principles (Aroonsrimorakot, Laiphrakpam, Arunlertaree & Korattana, 2020).

Economic sustainability refers to the establishment and preservation of an economic structure that ensures the highest possible level of well-being for present and future generations despite limited resources. Green office practices contribute to economic sustainability by aiming to reduce costs and increase efficiency. Conversely, economic sustainability also provides guidelines that enhance the applicability and continuity of green office practices (Markulev & Long, 2013).

Social sustainability is the continuity of the well-being of the individual and society through practices such as equality in access to basic social services, respect for cultural differences, broad participation in political processes, and social support network mechanisms (Littig & Griessler, 2005; McKenzie, 2004). Green office practices such as ergonomic furniture, natural light, a quiet work environment, air quality, etc., which are included in the scope of social sustainability, are fundamental requirements that ensure the strengthening of the psychological, physical, and social well-being of employees (Kantola, 2019). As can be seen, there is a mutually transforming interaction between the environmental, economic, and social sustainability dimensions of green office practices.

It is important for field experts working in work environments where green office applications are implemented to have sustainability-oriented professional competencies in terms of supporting environmental, economic, and social sustainability. Indeed, office management experts such as executive assistants, medical secretaries, legal secretaries, and customer representatives play a key role in creating a supportive organizational climate, culture, and structure in addition to implementing green office applications and ensuring that sustainability principles are implemented in office management. Sustainability principles in office management are necessary for organizational efficiency and social welfare, as well as environmental responsibilities. In this context, green office applications in the context of sustainability in office management are an important tool in terms of strengthening the corporate culture supporting sustainability and triggering social change in line with sustainability principles.

2. Research Problem

The changing conditions of the 21st century, characterized by ecological degradation, economic imbalance, political instability, and social turmoil, make it difficult to achieve sustainability goals. However, the solution to ongoing problems depends on implementing environmental, economic, and social sustainability principles with a holistic perspective. At this point, rather than an approach that prioritizes any of the sustainability dimensions, it should be supported by a series of regulations such as environmental protection policy, efficient resource use guidelines, practices that support economic stability, creating a social assistance and safety net, etc.

Environmental sustainability refers to maintaining the capacity of natural resources to meet societal needs at the same level for both present and future generations. It is based on the principle that economic and social activities should be carried out while preserving ecological balance (Morelli, 2011). In this context, environmental sustainability focuses not on the speed of development but on how it is achieved.

Economic sustainability is the conduct of financial activities in a way that maintains the stability of economic growth and preserves the level of capital (Stiglitz, Sen, & Fitoussi, 2009). However, this growth and stability are sustainable if they are achieved without harming the environment and by observing social justice. Therefore, economic sustainability requires financial activities to be conducted without compromising the principles of environmental and social sustainability (Anand & Sen, 2000).

Social sustainability is the improvement of the quality of life by meeting the basic needs of the in-

dividual and the provision and continuity of social welfare (Woodcraft, 2015). In this respect, social sustainability is not limited to social justice and quality of life but also forms the basis of environmental and economic sustainability. Social sustainability includes preventing the damage to natural resources and encouraging economic growth (Ruževičius, 2012). From this, it is understood that sustainability requires a balanced blend of environmental, economic, and social sustainability.

Sustainability should be addressed with an interdisciplinary and holistic perspective with its economic, environmental, and social dimensions (Munasinghe, 2004; 2009). Because business performance is not limited to economic indicators, it also includes the environmental and social consequences of activities (Elkington, 1997). In this context, it is important to implement green office practices within the scope of sustainable office management in offices, which are the main centers where business activities are carried out (Aroonsrimorakot, Laiphrakpam, Arunlertaree, & Korattana, 2020; Holmes & Hacker, 2007). Green office practices aim to reduce the consumption of natural resources by increasing the environmental efficiency of offices, to support sustainability by increasing the environmental awareness of employees, and to strengthen the fight against climate change with the use of renewable energy resources [World Wide Fund for Nature (WWF), 2016].

The Intergovernmental Panel on Climate Change (IPCC, 2023) reports that human activities are the main cause of global warming. According to the report, human-induced factors such as fossil fuel consumption, unsustainable consumption habits, changing land use patterns, etc. cause serious and irreparable consequences such as more frequent and severe weather events and rising sea levels. In addition, increasing temperatures, unpredictable weather conditions, floods, droughts, and famines, along with climate change, threaten the existence of plants, animals, and humans (Holmes and Hacker, 2007). At this point, adopting policies, strategies, and habits aimed at preventing climate change at social, organizational, and individual levels is an issue that should not be neglected. On the other hand, policies implemented at the global level should be supported by sustainable workplace practices.

Strategic guidelines indicating the sustainability policies of the company, documentation of the process, and regular feedback at the individual level facilitate the active participation of employees and increase their motivation. The manager has a key role in the implementation of sustainability policies but should be supported by the way employees do their jobs. Managers take on the role of a change agent, who guides the process and is determined and supportive. Green office practices are one of the most effective ways to ensure that employees support sustainability (Brazdauskas & Zirnele, 2020; Ones & Dilchert, 2012; Robertson & Barling, 2013).

The concept of a green office is a practice that aims to contribute to sustainable development by reducing the negative impacts of office activities on the environment (Brazdauskas & Zirnele, 2020). Green office practices consist of a series of activities that ensure the adoption and implementation of environmental, economic, and social sustainability principles such as reducing environmental impacts, efficient use of resources, and ensuring workplace peace in businesses (Kuhre, 1995; Hempbill, 2013). However, seemingly small steps such as using computers in power-saving mode, preferring double-sided photocopying, turning off unnecessary lighting, recycling waste, and using environmentally friendly options such as bicycles for transportation have significant positive results (Aroonsrimorakot et al., 2020). However, the sustainability of green office practices relies on the support provided by green buildings. A green building is the creation of the infrastructure that enables green office practices to be carried out throughout the building (Holmes & Hacker, 2007; Kibert, 2016).

Green office practices include efficient use of energy and water, management of waste and recycling, use of environmentally friendly transportation and materials, reduction of ecological footprint, paperless office approach, raising employee awareness, etc. (EPA, 2020; Lozano, 2006; UNDP, 2019). Energy and water saving means using natural resources effectively and efficiently without waste (Moezzi and Lutzenhiser, 2010). Waste and recycling management is the reprocessing of all kinds of discarded materials into usable products (Wilson, Velis, and Cheeseman, 2006). Environmentally friendly transportation includes using public transportation, bicycles, or walking, as well as vehicles that reduce greenhouse gas emissions by utilizing renewable energy sources (Banister, 2008; Black, 2010). Paperless office management is the transfer of all transactions and processes carried out on paper in traditional office management to the digital environment (Sellen and Harper, 2002).

To adopt green office practices throughout the company, a sustainability team consisting of employees from different departments responsible for auditing, implementation, and training should be established. The sustainability team should be equipped with the authority and responsibilities it needs as well as the freedom to use initiative when necessary. At this point, the support of the management, the visibility of green office practices (via official website, social media, posters, etc.), the reward system that motivates employees, and the support of the process with training and consultancy services are important (Brazdauskas & Zirnele, 2020). Although the focus of green office practices is environmental sustainability, sustainability contributes to economic and social sustainability by its very nature.

Rapidly increasing urbanization, rising energy costs, and global pressures on environmental sustainability make it inevitable to adopt more efficient, environmentally friendly, and human-centered approaches in office management. In this situation, "green office" practices that focus on cutting down carbon emissions, supporting sustainable office work, saving energy, using resources wisely, and reducing waste (Aroonsrimorakot, Laiphrakpam, & Sarapirom, 2021) are important because they not only save money but also help the environment and support responsible business practices. Green office strategies produce concrete outputs for sustainability by implementing multifaceted goals such as reducing resource consumption, minimizing environmental damage, increasing employee well-being, and reducing operational expenses. In this context, we should specifically address each relationship of green office practices and environmental, economic, social, and cultural sustainability types, and we should examine in detail how the practices integrate with the multidimensional sustainability perspective.

Economic sustainability and green office practices aim to provide long-term economic gains and are fundamentally based on environmental sustainability and green office practices. For example, paperless office practices, double-sided printing policies, use of recycled paper, encouragement of digital distribution, and use of LED lamps and motion sensor lighting systems create lower expenditure costs and provide profit in the long term. Again, profit is made from the meal and travel expenses paid to employees by offices operating remotely or in a hybrid model. Therefore, all activities carried out within the scope of green offices not only support environmental sustainability efforts but also support economic sustainability.

Green office practices, which have become widespread in many institutions, especially universities in Europe, contribute to the development of institutional policies in addition to raising awareness about sustainability (Filho, Salvia, & Pretorius, 2019). However, although sustainability awareness has increased in both the public and private sectors in Turkey, there are still areas open to development, especially in practice. While the "Green Campus" and "Green Office" practices of universities lead the way in raising awareness, the need for systematic sustainability practices continues (Arslan & Arslan, 2021; Kılkış, 2006). At this point, the awareness of faculty members and administrative staff, students, and managers, as well as their voluntary participation in the process, are determinants of its effectiveness and level of success (Brazdauskas & Wiek, 2017; Salvia, Filho, Brandili, & Griebeler, 2020).

Office Management and Executive Assistantship, Court Office Services, Call Center Services, and Medical Secretarial and Documentation Office Services and Secretarial are programs that train administrative assistants, legal secretaries, customer representatives, and medical secretaries. The awareness, adoption, motivation, and participation levels of these professional groups, who spend their entire professional lives in the office environment, regarding green office practices have the potential to make a significant difference in terms of sustainability. At this point, it is thought that the awareness, adoption, motivation, and participation levels of the faculty members working in the programs regarding green office practices are decisive.

The awareness, adoption, motivation, and participation levels of these professional groups, who spend their entire professional lives in the office environment, regarding green office practices have the potential to make a significant difference in terms of sustainability. At this point, it is thought that the awareness, adoption, motivation, and participation levels of the faculty members working in the programs in question regarding green office practices are decisive.

Executive assistants, legal secretaries, customer representatives, and medical secretaries have duties and responsibilities that directly or indirectly affect sustainability within the scope of green office practices such as electronic document management, paperless office management, recycling and waste management, use of environmentally friendly materials, and the execution of organizations (meetings, travel, etc.) by keeping the carbon footprint under control. Although the focus of green office practices is environmental sustainability, sustainability inherently contributes to economic and social sustainability.

Both international and domestic literature mainly focuses on the performance of green buildings (Geng, Lin & Zhu, 2020; Halıcıoğlu, Demirkapı, Gürel, & Kasul, 2023; Simons, Robinson & Lee, 2014; Zen, Subramaniam, Sulaiman, Saleh, Omar & Salim, 2016). However, there are studies examining the role of employees in sustainability in the context of green human resources (Kavgacı & Erkmen, 2021). There are studies focusing on environmental management systems and the expectations and perceptions of users working in green buildings.

When the studies on sustainability and green office applications in office management are examined in the literature, no studies specific to this field were found except for a book consisting of the papers presented at the 3rd International 18th National Office Management and Secretarial Congress with the theme of "New Business Models and Sustainability in Office Management," edited by Altınöz and Öztürk Başpınar (2024). However, the topics discussed include green office applications (Fuerst & McAllister, 2011; Thanayankizi, Ghai, Chakraborty & Seetharam, 2011), the amortization period of investments (Yalılı Kılıç & Yahşi, 2019), their operation (Adomßent,

Grahl & Spira, 2019), and implementation difficulties (Ong, Yusof & Osmadi, 2021). As can be seen, green office applications are not given enough space in both domestic and international literature and are not specifically addressed in the field of office management. It is believed that this study, which addresses green office applications within the scope of sustainability in office management, will make an original and important contribution to the field.

This research has drawn attention to the key role of executive assistants, medical secretaries, legal secretaries, and customer representatives in the implementation of sustainability strategies by addressing green office applications within the scope of sustainability in office management. These occupational groups have a duty and responsibility area that is effective in the adoption and dissemination of sustainability principles in business activities. At this point, obtaining the opinions of the faculty members of the Office Services and Secretariat and Medical Documentation and Secretariat departments plays a triggering role in the creation of a sustainability culture that starts from the office and spreads to the business and society, and in taking deep-rooted and permanent steps. Because the knowledge, awareness, skill, and competence levels of the faculty members become a strategic element that determines the direction and speed of the sustainability-oriented transformation in social development through education, research, and social contribution activities.

The purpose of this research is to deeply examine the awareness, perceptions, and experiences of the faculty members of the Office Services and Secretarial department regarding green office applications. In this context, the level of awareness, adoption, and application of green office practices among faculty members will be revealed. In this way, it is aimed to contribute to the restructuring of vocational education in the context of sustainability and the dissemination of sustainable office management based on green office practices. In line with this main objective, the following questions were sought:

a) What is a green office according to faculty members?

b) What are the faculty members' views on the place of green office applications in office management education?

c) What are the experiences of faculty members in integrating green office applications in office management education?

d) What's the future of green office applications in office management, according to faculty members?

3. Method

Since the research aimed to gain an in-depth understanding of the participants' subjective experiences and perceptions regarding green office practices, it was conducted with the interpretive phenomenology approach, which is a qualitative research design. In phenomenological studies, it is important to truly understand and explain the topic being researched (Cresswell, 2013; Patton, 2014) and researchers look for the meaning of participants' experiences by interpreting their personal and conceptual insights (Smith, 2001).

The research was conducted with the phenomenological design, which is accepted as essential to understand and explain the phenomenon under research with its true nature (Cresswell, 2013; Patton, 2014). Phenomenology interprets what the participants convey within the framework of conceptual and personal information and tries to find the meaning of the participants' experiences (Smith, 2001). The research was carried out using the qualitative interview technique. Qualitative interview techniques give participants the opportunity to reveal their perspectives on the subject (Kvale, 2005).

The universe of the study consists of faculty members working in the Office Services and Secretarial Departments of Social Sciences Vocational Schools and the Medical Documentation and Secretarial Program of Health Services Vocational Schools in Türkiye. The purposeful sampling method was used to determine the study group. Purposeful sampling is based on the principle of selecting individuals with in-depth knowledge of the subject under investigation. In this context, the analogous sampling method was adopted from purposeful sampling methods (Yıldırım and Şimşek, 2018). Faculty members who have been working in the Office Services and Secretarial Department of Social Sciences Vocational Schools or the Medical Documentation and Secretarial Program of Health Services Vocational Schools for at least five years were included in the study group.

A semi-structured interview form titled "Interview Form on Green Office Practices and Sustainability in Office Management" was developed by the researcher. The process of developing the interview form consisted of three stages. In the first stage, studies conducted on the subject were examined, and a draft form was created. In the second stage, the draft interview form created was sent to field experts, and their opinions were requested. In this context, opinions of faculty members with ten years or more experience working in various universities in the fields of office services and secretarial or medical documentation and secretarial were consulted. In the last stage, the form was finalized by taking into account the opinions of the experts. The semi-structured interview form used in the research included the following questions:

1. What does the concept of "green office" mean to you? How do you define this concept?

2. Why do you think green office practices are important for office management?
3. To what extent do you think environmental awareness or sustainability issues are included in office management education?
4. Do you address green office practices in your course content? Can you give examples (materials used, activities, projects, sample application reviews, etc.)?
5. If you cover green office applications in your course content, what are the difficulties you encounter in the process of integrating green office applications into office management education?
6. In your opinion, what knowledge, skills, and attitudes does an office manager need to have to effectively implement green office applications?
7. How do you assess the level of knowledge and awareness among your graduates regarding sustainability and green office applications in office management?
8. What kind of support or resources do you think are needed to develop awareness among students and educators regarding sustainability and green office applications in office management?
9. In your opinion, can green office applications become one of the core competency areas of the office management discipline in Türkiye? Why?

The research was conducted with the permission of Kırşehir Ahi Evran University Social and Human Sciences Scientific Research and Publication Ethics Committee dated 30.04.2025 and numbered 2025/08/21. The interviews were conducted with faculty members who have been working in the Office Services and Secretarial or Medical Documentation and Secretarial departments of vocational schools for at least five years in the spring semester of the 2024-2025 academic year. The data collection process continued until the interviews reached data saturation, and 15 faculty members were interviewed. The interviews were conducted with the approval of the participants after information about the subject and purpose of the research was provided.

Content analysis was used in the analysis of the data. The data analysis process consists of the following stages; (1) organizing the data and preparing it for analysis, (2) reading the data, (3) creating codes and themes, (4) interpreting the findings (Creswell, 2013; Yıldırım & Şimşek, 2018). In this context, the collected data were coded, themes were created and interpreted based on the coded data. However, since the researcher plays a key role in qualitative research, credibility, dependability, transferability and confirmability criteria (Lincoln and Guba, 1985; Cited in Creswell, 2013) were tried to be provided in order to ensure validity and reliability.

In order to ensure credibility, expert opinions were first sought in the creation of interview questions, and the interview form was finalized in line with the recommendations of the experts. Denzin and Lincoln (2005) state that comprehensive definitions of terms are necessary for qualitative researchers. Therefore, in order to ensure the transferability of the research, detailed descriptions of the data were attempted, and the findings were supported with direct quotations. To ensure confirmability, the transcribed data was sent to the interviewers, and approval was obtained before the analysis process was started. After the analysis was completed, the data was sent to two different researchers in order to ensure the reliability of the research. The researchers who examined the data analysis expressed their opinions on the appropriateness of the determined code, theme, and interpretation, and if they deemed it necessary, made corrections to the theme coding. The researchers' agreement percentages with the current analysis were calculated with the formula Agreement Percentage (P) = [Consensus (Na)] / Consensus (Na) + Disagreement (Nd) × 100, and it must be 70% and above (Miles and Huberman, 1994). The reliability of the research was ensured with 89% and 91% agreement rates.

4. Findings and Interpretation

When looking at faculty members' opinions about green office applications in office management, it becomes clear that they focus on themes like understanding green office applications, how useful they are, their role in education programs, their importance for office managers, and the future of these applications in office management.

4.1. Awareness Regarding Green Office Applications in Office Management

When the opinions of the faculty members regarding green office applications in office management are examined, in addition to the opinions providing information regarding their own awareness, there are prominent statements regarding the awareness levels of students/graduates regarding green office applications. Table 1 includes opinions regarding the awareness of the faculty members regarding green office applications in office management.

Tablo 1. Faculty Members Awareness Regarding Green Office Practices in Office Management

Themes	Examples of Direct Quotations	Frequency
Enviromental Protection Awareness	Office environments designed with environmental awareness (K1) Designing work and processes in offices without harming the environment or people (K5) Working environments with environmentally friendly conditions (K8) Conducting office activities without harming the environment (K10)	8
Efficient and Effective Use of Resourches	Carrying out office activities without harming the environment (K10) Choosing energy-efficient electronic devices and lighting (K5) A work area that prevents waste of environmental resources (K11) Saving economic, cultural, and social effort and energy (K13)	7
Decoration	Environments where decorative elements such as flowers are used (K14). Design office work in a way that does not harm people (K15)	2

According to Table 1, faculty members view green office practices in office management as encompassing environmental protection awareness, efficient and effective resource use, and decorative elements. In addition to these, there are faculty members who consider green office practices in the context of social sustainability in the form of "an environment where peace is provided" (K14) and in the context of sustainability in a holistic manner in the form of "Transformable" (K6), "Continuity of the world" (K1), and "Measures, practices, and policies for sustainability" (K14), etc.

When the participant views are examined, it is understood that green office applications in office management are seen within the scope of environmental sustainability rather than the social dimension of sustainability. However, the emphasis of the faculty members on the efficient and effective use of resources reveals that the concept is associated with economic sustainability. At this point, although the emphasis of the faculty members on ergonomic office design and the emphasis on "an environment where peace is provided" indirectly refer to social sustainability, it is obvious that the general tendency is to address green office applications in terms of environmental and economic sustainability. Based on this, it can be said that the environmental and economic sustainability awareness of the faculty members regarding green office applications in office management is high, while the awareness regarding social sustainability is low. Table 2 presents the faculty members' views on the level of awareness among students and graduates regarding green office applications in office management.

Table 2. Faculty Members' Opinions on the Awareness Level of Students/Graduates on Green Office Practices in Office Management

Themes	Examples of Direct Quotations	Frequency
Low	I have not observed such awareness unless the graduates either have a special interest in their own field or come from families that encourage it. I think the knowledge and awareness level of the students I graduated from is low. (K8)	6
Medium	I believe that the students who graduated five years ago lack sufficient awareness because we did not discuss these concepts thoroughly. (K7) I observe that they are somewhat aware of the information they receive from social media, but they lack practical experience in its implementation. (K1)	3
Sufficient	I generally evaluate it positively. Zero waste management is implemented in our university. Recycling units are used instead of trash cans in classrooms and corridors, and students separate waste according to its type and throw it away. In this way, they both learn to be sensitive to the environment and understand the importance of recycling. Our students adapted to this process very quickly. (K15)	2

As seen in Table 2, faculty members find the awareness of students and graduates regarding green office practices in office management to be low, medium, and sufficient. However, some statements from faculty members, such as "Unfortunately, I do not know how right it is to expect awareness on such a subject when even few people are aware of it (K2)" and "Negative, because they leave without being informed (K14)," highlight that awareness of green office practices should not be expected from graduate.

When the opinions of the faculty members regarding the green office applications of the students and graduates are examined, it is emphasized that the graduates develop awareness of the subject in case of personal tendencies or family guidance. However, there is a common view that systematic information is decisive in increasing the awareness level of both students and graduates regarding green office applications. In addition, it is understood that students easily adapt to the process when the necessary guidance is provided regarding sustainability and green office applications.

4.2. Functionality of Green Office Applications in Office Management

When the opinions of the faculty members regarding green office applications in office management are examined, it is seen that the faculty members draw attention to the functions of green office applications in providing effectiveness, efficiency and spreading innovations to a wide area. Table 3 includes the opinions of the faculty members regarding the functionality of green office applications in office management.

Table 3. The Opinions of The Faculty Members Regarding The Functionality of Green Office Applications in Office Management

Themes	Examples of Direct Quotations	Frequency
Ensuring Effectiveness and Efficiency	Offices are places where energy resources are used for a very long time, and even a second of extra usage in offices causes a substantial waste of energy in total. (K5) Offices are places where paper, computers, printers, etc., technological devices, and resources such as the internet and electricity are used intensively. Green office practices are important in terms of a clean environment and preventing waste through conscious consumption. (K7)	8
Innovation Dissemination	Although green office applications seem to protect business resources, they actually protect the world's resources and assets. These applications are the basic elements that determine the well-being of the individual and society, the workplace's peace, and the competitiveness of the business. (K3) Since employees in the office spend a lot of time in the office environment, I think that they can carry their green practices outside of work in time. (K9) Although the business seems to be protecting its resources, it is protecting the world's resources and existence. These practices are the basic elements that determine the well-being of the individual and society and the business's labor peace and competitiveness. (K11) Green office practices are important not only in the field of office management but also in all areas to leave a healthier living environment for future generations. (K13)	7

As seen in Table 3, the faculty members believe that green office applications in office management serve the functions of providing efficiency, productivity, and innovation. However, there are faculty members who express the opinion that green office applications need time to spread: "I think that green office applications that start in the office can have an impact in the process (K8). There are faculty members who state that sustainability is a necessity rather than a choice at the point reached with the 21st century: "Sustainability is no longer a choice but a necessity" (K9). When the functions of green office applications in office management to increase efficiency and productivity and spread innovations are considered, the opinions indicating that time is needed to obtain effective results and that it is not possible to give up on sustainability despite the difficulties in the process are striking.

There are faculty members who state that green office practices need time to spread: "I think green office practices that start in the office may impact the process (K8). There are faculty members who state that sustainability is a necessity rather than a choice at this point in the 21st century: "Sustainability is no longer a choice but a necessity" (K9). When the functions of green office practices in office management to increase effectiveness and efficiency and to spread innovations are considered, the views indicating that time is needed to obtain effective results and that it is not possible to give up sustainability despite the difficulties in the process are striking.

When the faculty members' views on the functionality of green office practices in office management are examined, it is seen that green office practices in offices provide both effectiveness and efficiency in resource use and the spread of sustainability awareness in different areas at individual, organizational, and social levels. Faculty members believe that the importance of green office practices has increased due to offices being resource-intensive working

environments and that green office practices are a powerful tool of change that can reach large masses and future generations over time. Therefore, 21. In the face of increasing sustainability pressure as the century progresses, green office applications have become an inevitable necessity in office management.

4.3. The Role of Green Office Practices in Office Management Education

When the opinions of the faculty members regarding the place of green office applications in the education program in office management are examined, it is understood that the applications are not mentioned at all in the courses (K1, K5, K6, K8, K10, K11), and even if they are mentioned, it is not at a sufficient level (K2, K7, K9, K12, K13). The opinions regarding the fact that green office applications are not mentioned in programs are as follows: "I have never come across any mention of green office applications in the books of branch courses related to office management (office management, executive assistant, etc.)." (K5). "It may be included in the Filing and Archiving course that we talk about the Electronic Document Management System; however, we talk about it as a current application rather than sustainability or green office applications. In this case, it cannot be said that I have covered it much." (K8).

There are faculty members who express the opinion that green office practices are not sufficiently addressed in office management education: "The topics that are covered especially in the sector applications course in office management education; however, although they are in the elective pool as a separate course, they are not very common courses" (K12). On the other hand, there are colleges that take green office practices into consideration. "We added environmental awareness and social responsibility courses to the curriculum in our college's Office Management and Executive Assistant program. It was previously mentioned in the office management course" (K14). In this context, it is understood that if courses on sustainability were added to office management programs, concrete steps would be needed specifically for green office practices.

It is understood that green office practices are associated with environmental sustainability rather than economic and social sustainability (K2, K9): "When necessary, I focus on green consumption and sustainability issues. However, I have never addressed the concept of "green office" (K2). "I touch on issues such as reducing paper usage (digitalization), throwing garbage in the recycling bin, using artificial light at a minimum level by making the most of sunlight, using sensor lighting, and turning off electronic devices when not in use" (K9). Green office practices are addressed within the scope of the course (K14) and social responsibility projects (K7) in office management education: "Green office practices were included in the subject of virtual offices. It will be included in more detail in the content of the environmental awareness course from the next semester onwards" (K14). "I address green office applications as applications in the courses with social responsibility projects in which students are the executives and participants (K7).

There are opinions (K3, K4, K15) that the courses on green office applications in office management remain at a theoretical level and cannot be supported by practice. "I think it is not given enough importance. New applications should be put into practice rather than talked about" (K4). "We cannot carry out a study on the implementation of what we explain" (K15); it is understood that education should be supported by practice. At this point, it is seen that the teaching staff needs to gain awareness and receive training on green office applications. "Unfortunately, I do not address it; however, this study raised awareness. I realized that I should spare even an hour" (K1). "I can't say that I cover it much in my classes. But I would like to receive awareness training on green offices. It would help me plan exactly what I will talk about in class" (K10).

There are some faculty members who state that there are some difficulties encountered when including green office practices in office management education: "I have difficulty finding realistic visuals when addressing the concept of "green hospitals," which we can think of as a sub-component of green office practices" (K14). "One of the difficulties encountered is that students do not have sufficient awareness and knowledge, especially about recycling" (K7).

When the opinions on the place of green office practices in office management are examined, it is understood that the concept is not addressed in the education programs, or even if it is addressed, it is not at a sufficient level. In addition, it is seen that the courses on green office practices in office management remain theoretical, cannot be supported by practice, and neither the faculty members nor the students have sufficient awareness and knowledge. In addition, green office practices in office management are addressed mainly within the scope of environmental sustainability rather than economic and social sustainability.

4.4. Green Office Practices as the Core Competence of the Office Manager

According to the views of the faculty members, the office manager should have environmental responsibility awareness, sustainability knowledge, and leadership and guidance skills regarding green office practices. Table 4 provides the views of the faculty members regarding green office practices as the basic competence area of the office manager.

Table 4. Green Office Practices as the Core Competence Area of the Office Manager

Themes	Examples of Direct Quotations	Frequency
Enviromental Responsibility Awareness	The office manager must first be aware of sustainability, the world's diminishing or misused resources, globalization, and the consequences of all this. Being aware of what they can do and the consequences of what they do constitutes the essence of the job. (K9)	10
Sustainability Information	First of all, technical knowledge is required because the efficient use of resources is important in the work done. For this, it should know technically what to do and how to do it using the least amount of resources. (K10) It is necessary to have knowledge on issues such as climate change, global warming, the power of the country in its resources, and green office examples. (K13)	9
Leadership and Guidance	The office manager should be a pioneer in actively implementing the practices, raising awareness, and emphasizing their importance. (K3) The subject should be adopted, applied, and then adapted to business life; while doing this, curiosity should be aroused, and then physical changes should be made in the office environment to create a green attitude. The green-behaving office personnel who transform attitude into behavior should be appreciated and rewarded. (K14)	8

Table 4 shows that the basic competence areas of the office manager in the context of green office applications consist of environmental responsibility awareness, sustainability knowledge, and leadership and guidance skills. Based on this, it is revealed that the office manager must have awareness, knowledge, and practical skills to be successful in green office applications in line with the views of the faculty staff. The office manager's level of awareness regarding green office applications, technical and conceptual knowledge, and leadership and guidance skills in practice come to the fore.

4.5. The Future of Green Office Practices in Office Management

There are faculty members who find the development of green office applications as a core competency area in office management impossible (K1, K8, K10, K12), who make it conditional (K14, K15), who see it as a possibility (K2, K3, K11, K13), and who think it is a necessity (K4, K5, K7, K9). Table 5 shows faculty members' views on the future of green office applications in office management.

Table 5. Faculty Members' Views on the Future of Green Office Applications in Office Management

Themes	Examples of Direct Quotations	Frequency
Impossible	As public awareness increases in Turkey, such a basic competency demand may arise from the office management discipline; however, we still need to get there. Despite intensive work in Türkiye and many other countries for years, society is not yet aware of sustainability. To put it simply, we have no idea what the recycling symbols on packaging actually mean. (K8) Unfortunately, we can't get them to accept that offices are vital for management. We are just seen as a part of bureaucracy. (K12)	4
Probability	Green practices can become one of the basic competence areas in all professions because sustainability has become a critical issue not only in terms of the environment but also in terms of business practices, corporate culture, and social responsibility. (K3) By emphasizing the environmentally and human-friendly aspects of the office management profession, it will modernize the profession both nationally and internationally and increase its quality. (K13)	4
Obligation	In my opinion, green office applications should become a core competency area in office management rather than being able to become one. Because offices serve as the foundation for both public and private establishments. The awareness of students and employees who will work in offices in each unit will contribute to society and is important for the future of our country. (K1) Public and private sector institutions are under pressure for sustainability-oriented transformation as sensitivity to the global climate crisis increases. Therefore, each of the students trained should have this competency. (K10)	4

Conditional	Maybe, but first the problem of irresponsibility must be eliminated (K14) "It may come; but for this, the contribution of only the instructors who provide education in this field will not be sufficient. Since it is a multifaceted concept, I think that the government, legislators, engineers from various fields (industrial, mechanical, civil, metallurgical, materials, etc.) and architects should also make intensive efforts in this regard in order to increase the applications made throughout the country" (K15).	2

As seen in Table 5, faculty members have different approaches to making green office applications a core competency area in office management. While some faculty members state that it is not possible for green office applications to become a core competency area in office management, others describe it as a necessity. However, some faculty members define green office applications as a "possibility" for becoming a core competency in office management, while others believe it can be achieved under certain conditions.

Among the suggestions made by faculty members to increase green office applications in office management are providing training (K2, K5, K7, K8, K10, K11, K12, K13), adding sustainability-related courses to education programs (K2, K3, K5, K7, K14, K15), carrying out projects (K5, K6, K8, K12), organizing conferences (K1, K5, K7), establishing an environmental club (K13), etc. In addition, faculty members emphasize that the process should be supported with social activities such as tree planting days (K13) and waste collection competitions (K13). In fact, among the faculty members' opinions, there is an emphasis that public institutions and organizations should establish a reward system (K15) to encourage sustainability and green office practices.

5. Conclusion and Recommendations

Faculty members concentrates their awareness of green office practices in office management within the context of environmental and economic sustainability. Green office practices are associated with basic sustainability functions such as efficiency in resource use, environmental sensitivity, and corporate responsibility. However, the emphasis on social sustainability remains indirect and limited. This situation shows that the social dimension of sustainability is neglected and the sensitivity in this area is not at a sufficient level.

Ong, Yusof, and Osmadi (2021), who revealed the difficulties of green office applications, highlight the low level of awareness on the subject as one of the basic elements that needs to be improved. However, the difficulties of green office applications mentioned in the study include budget and resource limitations, lack of experts, and structural factors. Based on this, in addition to increasing awareness of green office applications, there are structural and systematic obstacles that need to be overcome. However, when the situation is considered based on the research results, it is not possible to focus on solving structural and systematic obstacles in the current conditions, where awareness of even one of the basic dimensions of sustainability is low.

Faculty members attribute the awareness of students and graduates regarding green office practices to individual interest and family guidance and state that there is a need for systematic information and guidance. This indicates that office management education programs should be strengthened with a focus on sustainability. In line with this result of the research, Adomßent, Grahl & Spira (2019), who investigated the ways to make campuses sustainable, revealed that in addition to the lack of education on sustainability, systematic structures that create awareness are inadequate. Similarly, Altınöz and Öztürk Başpınar (2024) mention that education programs should be updated and systematic awareness studies should be conducted to develop sustainability awareness.

Faculty members state that green practices in office management can significantly contribute to spreading sustainability awareness because offices are resource-intensive work environments, and these practices have the potential to reach large audiences over time and be passed on to future generations. At this point, Adomßent, Grahl & Spira (2019) emphasize that the spread of sustainability should be implemented based on certain criteria. In fact, Geng, Lin, and Zhu (2020) attach importance to effective monitoring of the process and regular measurement and evaluation in the context of quality-efficiency-experience as much as starting green applications. Similarly, Halıcıoğlu, Demirkapı, Gürel, and Kasul (2023), who evaluated green office applications with Pareto analysis, stated that the process cannot be carried out effectively without receiving feedback from users and that training should be provided detailing quality standards in addition to information.

Education, curriculum updates, projects, conferences, environmental clubs, and reward systems are among the suggestions developed by faculty members to increase green office practices in office management. In addition to formal methods, social activities such as tree-planting days and waste collection competitions are steps that increase awareness of green office practices. Kavgacı and Erkmen (2021) conducted a study on green human resources

management and showed that employees whose environmentally sensitive behaviors were rewarded actively participated in the process. Monfared and Sharples (2011), who addressed the perceptions of practitioners regarding green building practices, argue that sustainability is not possible if active participation and belonging are not ensured. At this point, if communication strategies appropriate to the user profile are not developed and technical support is not provided when needed, there is a risk that the practices will remain on paper (Pei, Lin, Liu & Zhu, 2015). At this point, the study conducted by Simons, Robinson, and Lee (2014) to determine the qualities of green offices revealed that green practices are preferred for their individual comfort and health rather than their sensitivity to the environment. As can be seen, the sustainability of the impact of green office applications depends on the strengthening of education, application quality, and social awareness together.

- In office management education, green office applications remain theoretical, are not supported by practice, and are not sufficiently addressed. However, the awareness and knowledge level of faculty members and students is not sufficient. According to faculty members, to be aware of and have knowledge about green office applications in office management, technical and conceptual knowledge as well as leadership and guidance skills are needed. The opinions of faculty members differ on whether green office applications should be included among the basic competencies of the office manager. While some faculty members define this as a necessity, some attribute it to the realization of certain conditions, while others think it is not possible. Based on the research results, recommendations have been developed for policymakers, practitioners, office management faculty members, and researchers. Suggestions for policymakers are as follows:
- Sustainability themes should be made compulsory courses in vocational training programs that will provide added value in the spread of practices such as office management to include sustainability in educational programs.
- Core competencies related to environmental responsibility, economic sustainability, social sustainability, and leadership should be defined in occupational definitions that will provide added value in the spread of practices such as office management.
- Sustainability coordination centers that monitor, support, and report green office practices should be established in universities.
- Funding and incentive mechanisms that provide infrastructure, training, and budget for green office practices should be established.
- Award, monitoring, inspection, and tracking platforms that encourage joint sustainability efforts between institutions should be established.
- Sustainability criteria should be included in quality criteria in higher education, and field-specific evaluation guidelines should be created for their follow-up.

The recommendations developed for practitioners are as follows:

- Step-by-step sustainable office guidelines and standard procedures should be determined.
- Sustainability-focused orientation, seminar, and certification programs should be designed.
- Monitoring and feedback systems that actively evaluate the effectiveness of applications based on user opinions, surveys, Pareto analysis, etc. should be established.
- Socially interactive sustainability applications (tree planting days, waste collection competitions, etc.) should be implemented.
- Successful sustainability and green office applications should be presented to the attention of those concerned via digital platforms and given a guiding quality.
- Office physical/architectural arrangements should be made by taking sustainability design principles into consideration.

The recommendations developed for office management faculty members are as follows:

- Environmental, economic, and social dimensions of sustainability should be addressed in a holistic manner in courses.
- Simulations, trips, etc.: application-based learning environments should be created.
- In addition to providing students with information about sustainability, skills that support leadership and guidance skills should be emphasized.
- Green office-focused student projects, competitions, and social responsibility activities should be carried out.
- Sustainability-focused interdisciplinary joint courses and projects should be carried out.
- The suggestions developed for researchers are as follows:
- Studies should be conducted on social sustainability dimensions that are neglected in current studies.
- Researchers should investigate application methods and techniques of green office practices within the scope of sustainability in office management.
- Current studies addressing sustainability practices in higher education should be conducted.

- Researchers should conduct studies examining how green office practices interact with social and institutional culture.
- Priority should be given to studies that make future-oriented inferences on how current developments in information and communication technologies will shape green office practices.

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Researches on Multidisciplinary Approaches Multidisipliner Akademik Yaklaşım Araştırmaları

Research Article

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Investigation of the Effect of Pop-Up Types Used in Shopping Websites on User Attitudes[1]

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Abstract

With the widespread use of the internet, it has become possible to shop from anywhere in the world without time limit. Internet users make comments, share images, and rate the purchased product during their online shopping. In this way, it can influence other customers about the product. In recent years, shopping sites have been offering discounts to their customers, tracking customer satisfaction, and offering the opportunity to share their experiences in e-commerce. In this way, businesses can offer products and services to a wide range of customers through e-commerce. In this study, it is aimed to examine the effect of pop-up types used on shopping sites on user attitudes. In the research, a shopping site was designed to enable users to gain experience by using pop-up types. Users evaluated the pop-up types with their experiences after using the shopping site. In this study, the relational survey model, which is a subtype of the general survey model, was used. The sample group in the study consists of students studying at Osmaniye Korkut Ata University in the 2024-2025 academic year. Appropriate sampling method was preferred to create a sample group. In the study, the questionnaire prepared by Yaman and Erdaş (2021) to reveal their perspectives on pop-up ads was used. According to the research results, individuals' attitudes towards the types of pop-ups used on shopping sites also vary according to their demographic characteristics. Variables such as gender and income level direct individuals' behaviors.

Keywords: Pop-up, Internet Advertising, Consumer Behavior, Pop-up Advertising, Attitude, Types of Internet Advertising, Sales Promotion.

JEL Codes: M15, L81, O32

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1. Introduction

Trade transactions carried out through virtual shopping environments via the internet are called e-commerce. E-commerce is websites and mobile application environments that do not require physical stores and payment tools. It has developed very rapidly in recent years and many researches have been carried out on e-commerce. Brokerage sites, opportunity sites, special shopping sites serve customers in different ways in the field of e-commerce.

A number of applications are used to make shopping sites attractive. One of them is pop-up ads. Pop-up ads; these are the forms of online advertising on the WWW (World Wide Web) through the web browser called web browser or web browser. Pop-up ads are a visual window that appears spontaneously when the relevant web page is opened in the web browser. Pop-up ads are ads that suddenly appear on part or all of the screen, usually presented as a separate window or box. Pop-up ads are intended to attract the user's attention. Various content can be presented to the user. In addition, pop-up ads can perform timed or action-based actions to increase effectiveness.

With the developing technology, marketing activities require the blending of traditional and modern methods. Today's marketing convergence scenario largely leverages the internet and related technologies. Advancements in web technologies have led to the overall integration of electronic and traditional marketing efforts to create best practices. This integration is an important foundation for e-commerce. Pop-up ads are mostly used on websites with high visitors. When the user clicks on the pop-up, a separate web page opens. Pop-up ads feature attractive audiovisual graphics and animations (Mehta et al., 2010, p.51; Base, 2020).

A significant amount of literature has been published on pop-up ads, but many researchers have specified different variables based on their assumptions in their research papers. It is important to find the most promising variable based on research expectations. In e-commerce, it is necessary to find the emotions that customers have (Krushali et al., 2018, p.720). Studies have shown that pop-up ads have differences in purchasing behavior between generations. It has been determined that pop-up ads lead to purchasing behaviors, especially in individuals in the z generation (Yaman and Erdaş, 2021). It has been observed that young people spend time on the internet and prefer shopping sites for reasons such as convenience, saving time, providing access to a wide variety and affordable prices (Tanyıldızı and Demirkıran, 2018, p. 41). In this sense, it is thought that the opinions of young people are important in examining the effect of pop-up types used on shopping sites on user attitudes.

With this research, users were provided with user experience (UX) in the field of e-commerce. The user experience (UX) provided in the research is a strong example of the "learning by doing" method as a process. In this sense, this research is important because it concerns different disciplines such as software development, design, business and marketing.

The problem statement of this research is: "What are the attitudes of university students towards the types of pop-ups used on shopping sites?"

2. Literature Review

In their study, Özen and Sarı (2008) tried to determine the attitudes and behaviors of internet users towards internet advertisements according to the dimensions determined as disturbing, effectiveness, usefulness, reliability and popularity of internet advertisements with a field study in which they formed a sample of academic staff. In the study, it was seen that pop-up ads were the second most disturbing type of advertising with a rate of 53.5%. McCoy et al., (2004) found that users find pop-up ads annoying because they interfere with their use of web pages. Pala and Sezgin (2021) examined the effect of pop-up ads on the consumer purchasing process in their study. It has been found that the attitude towards pop-up ads affects the purchasing process, the emergence of the need, the identification of alternatives, the evaluation of alternatives, the purchase decision, post-purchase attitudes and behaviors. In his study investigating the impact of pop-up ads on consumers, Bozkurt (2023) observed that pop-ups suggesting discounts were perceived positively, undecided users were interested in the pop-ups offered, and determined users could change their minds. In their study, Hsieh et al. (2021) examined the timing of the appearance of pop-up ads and the effect of this timing on perceived intrusiveness. When the pop-up ad is delayed by 20 seconds, the perceived intrusiveness is of low value and the user gains positive attitudes.

In his study in which he examined the types of internet advertisements comparatively in terms of consumer attitudes, Çalıkuşu (2009) ranks second after banner ads according to the dimensions of the most clicks, attention-grabbing and memorability. In the study, consumer behaviors towards pop-up ads were investigated according to gender, education level, age group and monthly income level; Hanbazazh and Reeve (2021) found that consumers do not like pop-up ads, have a negative attitude towards pop-up ads, and pop-up ads create a sense of discomfort and anger. Focusing on web users' attitudes towards web ads, researchers have examined the impact of entertaining, annoying, and informative factors on pop-up ads. Katuwandeniya and Abeywardana

(2019) have revealed that entertainment has no effect, disturbing has no negative effect, and informative has no effect.

In the comparative studies of Le and Vo (2017) on banner, pop-up and inline ads, the attitudinal dimensions of information, annoyance and entertainment were applied. Banner ads, the most informative and entertaining type of advertising in terms of informative and entertainment attitude, were found to be the most disturbing pop-up ads in terms of the level of annoyance. In their study, Willermark et al. (2020) investigated the user experience of modal pop-ups based on the click event, which is called polite pop-ups. They found that polite pop-ups were not perceived by users as annoying. In his study, Uma (2024) reveals that social media users perceive that pop-up ads build trust about products, they are satisfied with pop-up ads, and they intend to recommend pop-up ads to others.

In their study, Mbugua and Ndavi (2021) reveal that internet users have negative attitudes towards pop-up ads, which is due to the intrusive and obstructive nature of pop-up ads. In their study, Edwards et al. (2002) examined four advertising elements that can reduce the perception of pop-up ads as intrusive, such as display timing, ad duration, compatibility with editorial content, and perceived information and entertainment value. Pop-up ads evoke a feeling of discomfort when perceived as intrusive, and therefore ads are avoided, and viewers experience interruptions more intensely when they are focused than when they are not focused; It found that when pop-ups provide value in the form of information or entertainment, they are perceived as less disruptive and less disruptive. Simamora and Sitanggang (2023) determined that pop-up ads have a positive effect on e-commerce advertising and brand image in their study. Yetkin and Basal (2024) investigated the effect of pop-up ads on consumers' brand attitudes, their perceptions of pop-up ads, and their attitudes towards the brand in pop-up ads, and concluded that there is a positive relationship between pop-up ads and brand attitudes. Ristiand and Abdi (2024) found that pop-up ads have a direct and positive impact on customer satisfaction; However, it reveals that pop-up ads do not have a direct and positive effect on customers' repurchase decisions. In addition, sales promotions appear to have a direct and positive impact on customer satisfaction. Balhareth (2023) examined buyers' intentions towards online pop-up ads and their impact on purchasing behavior. In his study, he evaluated factors such as attitude, impulsive behavior, intention to visit pop-up ads, and impact on the purchase decision. The impulsive propensity to buy and the attitude of buyers are strongly influenced by pop-up ads; It has been concluded that while the images, videos and attention-grabbing statements in the ads shape the buyers' decisions to visit or purchase the site, positive or negative attitudes towards the products determine the preference or rejection of pop-up ads. Azeem and Ul-haq (2012) found that pop-up ads are often perceived by users as intrusive and disruptive elements as they interrupt the user experience and negatively affect the browsing process.

3. Method

The data collected in the study were collected in the spring semester of the 2024-2025 academic year at Osmaniye Korkut Ata University via Google Form. In the study, survey method was preferred as a data collection method. Since the research was conducted to study the experiences of shopping website users directly and by requiring primary data, data was collected through a survey. The questionnaire used consists of demographic questions and statements prepared on a five-scale scale such as completely disagree, disagree, no opinion/undecided, agree, completely agree. The questionnaire used in the study was prepared by Yaman and Erdaş (2021). The reliability of the questionnaire used in the study was tested and the questionnaire was found to be reliable (Cronbach Alpha = 0.74) (Yaman and Erdaş, 2021). The applied questionnaire form is given in Appendix-1.

Ethics committee report for the study; taken from Osmaniye Korkut Ata University Social Sciences and Humanities Research Ethics Committee with the decision number 2025/1/7 dated 06.01.2025. This report was sent with the study.

Within the scope of the study, a shopping site with examples of pop-up types was created by the researchers. Website; It was developed using HTML, Bootstrap 5.3.3 to create a modern and flexible user interface, and jQuery 3.7.1 to provide an interactive user experience. While Bootstrap has ensured that the page has a responsive structure that adapts to different device and screen sizes, it has contributed to the creation of a regular, aesthetic, and user-friendly design thanks to the ready-made components it offers. Dynamic content management has been effectively implemented with jQuery, and the user experience has been made more fluid by optimizing interactive elements to run smoothly. In Figure 1, the shopping website designed for the research is given.

Figure 1. Shopping Website Designed for Research (www.serifekeles.com.tr)

The shopping website designed by the researchers was made available to all users. The website records are available where the participants actively used and then answered the survey questions. Personal data was not shared within the scope of the personal data protection law. Participants accessed the website from different IPs, N=142 of them participated in the surveys. The IP addresses of the participants are confidential. Information about the participants' access to the website is given in Figure 2.

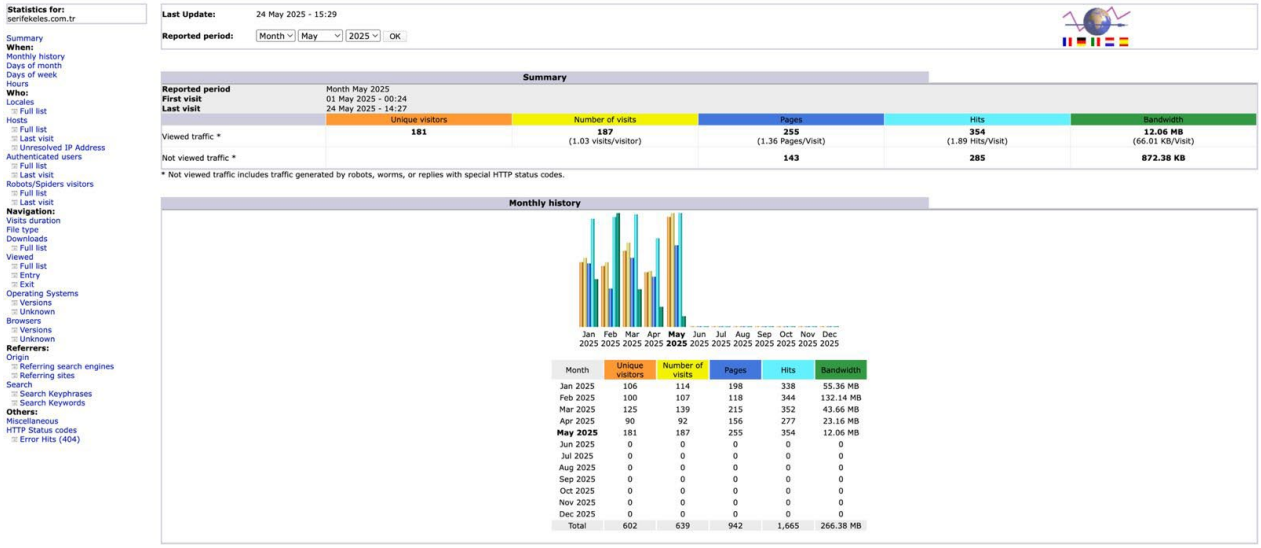

Figure 2. Information About the Participants' Access to the Website

As shown in Figure 2, the participants visited the website frequently between January 2025 and May 2025. In this way, the participants practiced with the pop-up types used in online shopping sites.

On the shopping website designed by the researchers, the pop-up types in Table 1 were presented on the screen at certain time intervals. In this way, users accessing the shopping site have gained experience with the types of pop-ups used on shopping sites before filling out the survey form.

Table 1. Screenshots of Pop-Up Types Prepared within the Scope of the Research

		

Table 1 shows screenshots of examples of pop-up types used on shopping sites. The types of pop-ups in Table 1 and their descriptions are given below.

1. **Spin the wheel pop-up template:** It is a digital version of the classic wheel of fortune crafted to grab users' attention.
2. **Scratch pop-up template:** With the scratch pop-up, it is ensured that the offers offered by the brand to the user are received by scraping confidential information using a virtual currency.
3. **Welcome discount pop-up template:** Intended for new visitors on shopping sites, these pop-ups encourage users to sign up for an email subscription or create an account. In return, they are often offered a discount that will apply to their first purchase. By collecting contact information from potential customers, this strategy helps the business expand its customer database and build a more effective audience for future marketing activities.
4. **Personalized pop-up template:** It is used to offer special discounts, birthday campaigns or benefits for specific customer segments based on each individual's interests, shopping habits, and past purchase data.
5. **Event-based discount pop-up template:** Seasonal campaigns are prepared by taking into account certain special days or seasonal events. For example, during peak shopping periods such as "Black Friday" or "New Year's Eve", it offers themed discounts and promotions to attract consumer attention and increase sales.
6. **Product or category custom discount pop-up template:** This type of pop-up is designed to promote discounts specific to a specific product or product category. It aims to inform users about deals that are only valid on selected products or certain categories, and to direct them to related products.

4. Research Model

The research aims to reveal the relationships between the types of pop-ups used in shopping sites by university students on user attitudes. The research was carried out according to the relational survey model of the general survey model, which is one of the quantitative research designs. Büyüköztürk et al., (2008) relational survey model; It is expressed in the form of a research model used to determine the relationship between two or more variables and to obtain clues related to cause and effect.

4.1. Sample Group

The sample group in the study consists of students studying at Osmaniye Korkut Ata University in the 2024-2025 academic year. Appropriate sampling method was preferred to create a sample group. 142 students participated in the study. This sample was determined because the research expected the use of the website, such as user experience and learning by doing method.

4.2. Analysis of Data

In the study, the data obtained in order to reveal the attitudes of university students towards the types of pop-ups used in shopping sites were analyzed using the SPSS 26 program. After the collected data were entered into the SPSS program one by one, the findings were evaluated by taking into account the opinions of the experts and the results were shown in tables.

The answer scores to be given to each question on the five-point scale applied to the participants vary between 1.00-5.00. On the five-point graded scale applied to the participants, the score ranges were determined as follows, including five units (4/5) of 0.80 points each: 1.00-1.80 Completely Disagree 1.81-2.60 Disagree 2.61-3.40 No Opinion/Undecided 3.41-4.20 Agree 4.21-5.00 Completely Agree.

In the study, the reliability of the questionnaire was tested in the analysis of the data. Kaiser-Meyer-Olkin (KMO) and Barlett's test was used in the research to determine the suitability of the data for factor analysis. The percentage and frequencies of the participants were given in revealing the demographic data. The opinions of the participants about the types of pop-ups used in shopping sites, frequency, percentage distributions and arithmetic averages are given. Based on the hypotheses, the normality test was applied. Since the scores obtained as a result of the normality test did not show a normal distribution, the Mann-Whitney U test, which is a nonparametric statistical test, was used to exami-

ne whether the two samples with quantitative-scale observations came from the same distribution, and Kruskal-Wallis ranked one-way analysis of variance was used to test the equality of the medians of the population between independent groups.

5. Results

In this section, the findings consisting of the data obtained as a result of the stages in the method section of the research are emphasized. The findings were discussed in a certain systematic, the tables formed by the findings were included, and then the table was briefly explained and interpreted.

The reliability of the questionnaire used in the study was tested and the questionnaire was found to be reliable (Cronbach Alpha = 0.709). Accordingly, the scale items were perceived as consistent by the sample and had high reliability.

Kaiser-Meyer-Olkin (KMO) and Barlett's test was used in the study. The findings of KMO and Barlett tests are given in Table 2.

Table 2. Kaiser-Meyer-Olkin and Barlett's Test Results

Kaiser-Meyer-Olkin and Barlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,846
Bartlett's Test of Sphericity	Approx. Chi-Square	592,004
	df	66
	Sig.	,000

According to Table 2, the Kaiser-Meyer-Olkin (KMO) value was found to be 0.846. The Kaiser-Meyer-Olkin (KMO) value is a measure of whether the sample is sufficient for SPSS to perform an accurate factor analysis. A KMO value above 0.80 is defined as "good enough". With Bartlett's test, it was checked whether the data matrix was a unit matrix and whether the correlation between the variables was sufficient. Bartlett's Sphericity Test was found to be Sig. ,000. Since the p-value value is < 0.05, the dataset is suitable for factor analysis.

The research was carried out on people with different genders and monthly expenditure amounts of university students. In Table 3, the demographic characteristics of the participants are given.

Table 3. Demographic Information of Participants

Gender	Number	%
Female	68	47,9
Male	74	52,1
Income Level	**Number**	**%**
1000 - 1500 TL…	16	11,3
1500 - 2000 TL…	16	11,3
2000- 2500 TL…	17	12
2500 - 3000 TL…	19	13,4
3000 TL - over...	74	52,1

Table 3 gives the demographic characteristics of the respondents. The gender variable is especially important in shopping sites. Demographic characteristics also include the income levels of the participants. 47.9% of the participants were women and 52.1% were men. When the distribution of the participants according to their income levels was examined, it was determined that the participants with an income of 3000 TL and above were 52.1%, while the participants with an income between 2500 TL and 3000 TL were 13.4%, the participants with the lowest income level were 11.3% with an income between 1000 and 1500 TL and between 1500 and 2000 TL.

The distribution of the opinions of the participants about the types of pop-ups used in shopping sites is given in Table 4.

Table 4. Frequency, Percentage Distributions and Arithmetic Averages of the Opinions of the Participants on the Pop-Up Types Used in Shopping Sites

Propositions	Completely disagree		I disagree		I'm undecided		Agree		Totally agree		$\bar{x}$
	f	%	f	%	f	%	f	%	f	%	
1. When I open any site, I close the pop-up ad that appears without looking.	12	8,5	28	19,7	35	24,6	36	25,4	31	21,8	3,32
2. I'm interested in pop-up ads.	33	23,4	43	30,5	29	20,6	33	23,4	3	2,1	2,5
3. I don't want to buy the pro-duct I see the pop-up ad for.	11	7,9	30	21,4	49	35	31	22,1	19	13,6	3,11
4. I have instal-led blocking programs on my internet ac-cess devices due to pop-up ads.	34	24,3	53	37,9	24	17,1	19	13,6	10	7,1	2,42
5. I have a ne-gative perspe-c-tive towards the company whose pop-up ad I see.	24	16,9	40	28,2	52	36,6	17	12	9	6,3	2,62
6. I find pop-up ads anno-ying	12	8,5	29	20,6	30	21,3	43	30,5	27	19,1	3,3
7. I think that the products in pop-up ads are of poor quality.	11	7,8	37	26,2	62	44	18	12,8	13	9,2	2,89
8. I immediately close the websi-te where I see pop-up ads	16	11,3	42	29,6	28	19,7	37	26,1	19	13,4	3
9. I have purcha-sed the product I saw in the pop-up ad at least once	44	31,2	42	29,8	25	17,7	27	19,1	3	2,1	2,31
10. I think I can be deceived by pop-up ads.	8	5,6	23	16,2	40	28,2	53	37,3	18	12,7	3,35
11. I turn off the tool from which I access the internet due to pop-up ads.	28	19,7	46	32,4	38	26,8	25	17,6	5	3,5	2,52
12. If there were no pop-up ads, I would use the internet more efficiently.	8	5,6	25	17,6	44	31	40	28,2	25	17,6	3,34

When Table 4 is examined, it is seen that the participants agree with the proposition "I think I can be deceived by pop-up ads" ($\bar{x}$ = 3.35) and "I would use the internet more efficiently without pop-up ads" ($\bar{x}$ = 3.34). Again, some of the participants of the research state that they agree with the proposition "When I open any site, I close the pop-up ad I see without looking at it" ($\bar{x}$ = 3.32). "I find pop-up ads annoying" was another item mentioned by the participants ($\bar{x}$ = 3.3). In the study, in which the effect of pop-up types used on shopping sites on user attitudes was examined, it was seen that the participants agreed with the suggestion "I bought the product I saw in the pop-up ad at least once" at the lowest rate ($\bar{x}$ = 2.31).

Regarding the data obtained in this study, in which the user attitudes of the pop-up types used in the shopping sites of university students were investigated;

H_0: With 95% confidence, the data are normally distributed.

H_1: With 95% confidence, the data are not normally distributed.

After the normality test applied based on the hypotheses, sig. Since its value was found to be less than 0.05, the H_1 hypothesis was accepted. In other words, it can be said with 95% confidence that the data are not normally distributed.

It was examined whether the gender of the participants and the types of pop-ups used on shopping sites had an effect on user attitudes. Since the scores obtained as a result of the normality test in the study did not show normal distribution, the Mann-Whitney U test, which is a non-parametric statistical test, was applied to examine whether the two samples whose quantitative-scale observations were given came from the same distribution. Table 5 presents the findings obtained from the Mann-Whitney U test.

Table 5. Mann Whitney U-Test Results Regarding the Opinions of the Participants on the Pop-Up Types Used in Shopping Websites by Gender

Average of Responses	Gender	n	Mean Rank	Sum of Ranks
	Female	68	69,99	4759,00
	Male	74	72,89	5394,00
	Sum	142		

	Average of Responses
Mann-Wihtney U	2413,000
Wilcoxon W	4759,000
Z	-,422
Asymp. Sig. (2-tailed)	,673

Table 5 shows the results of the Mann Whitney U-test, which was calculated to determine the difference between the scores of the participants regarding their opinions about the types of pop-ups used in shopping sites according to their gender. Accordingly, the p value of the opinions of the participants was found to be .673.

Accordingly, it is seen that there is no statistically significant difference between male and female participants according to the attitudes of the users [U=2413.00; p=0.673 p> .05].

It was examined whether the monthly expenditure amounts of the participants and the types of pop-ups used on shopping sites had an effect on user attitudes. Since the scores obtained as a result of the normality test in the study did not show normal distribution, the non-parametric statistical test Kruskal-Wallis ranked one-way analysis of variance was used to test the equality of the population medians between independent groups. Table 6 presents the findings obtained from Kruskal-Wallis ranked one-way analysis of variance.

Table 6. Kruskal-Wallis Test Results Regarding the Opinions of the Participants on the Pop-Up Types Used on Shopping Sites According to the Monthly Expenditure Amounts

	Monthly Expenditure Amount
Kruskal-Wallis H	5,273
df	4
Sig.	,260

Table 6 presents the results of the Kruskal-Wallis test, which is calculated to determine the difference between the scores of the participants regarding their opinions on the types of pop-ups used on shopping sites according to their monthly expenditure amounts. Accordingly, the p value of the participants' opinions was found to be .260. According to the findings of the research, there is no significant difference between the monthly expenditure amounts of the participants and their opinions on the types of pop-ups used on shopping sites, since $p>0.05$.

6. Conclusion

When we look at the literature on the types of pop-ups used in shopping sites, pop-up ads are a type of advertising that is generally perceived as disturbing by internet users, but some studies show that they can have positive effects under certain conditions. Pop-up ads can also increase conversion rates through targeted advertising. Pop-up ads are an eye-catching way to highlight special campaigns.

Some studies have found that pop-up ads are negatively received by users due to their intrusive nature (McCoy et al., 2004; Mbugua and Ndavi, 2021). Özen and Sarı (2008) state that pop-ups are the second most annoying type of advertising, while Azeem and Ul-Haq (2012) emphasize that these ads interrupt the user experience. Çalıkuşu (2009), on the other hand, found that consumers have a negative attitude towards pop-up ads and create a sense of discomfort and anger. On the other hand, some studies show that pop-up ads can be perceived positively under certain conditions. For example, Bozkurt (2023) observed that pop-ups offering discounts are effective for undecided users and may change their minds. Hsieh et al., (2021), on the other hand, revealed that the timing of pop-ups is important, and ads shown with a 20-second delay are perceived as less intrusive. Willermark et al. (2020) determined that click-based modal pop-ups were not found to be disturbing.

The effects of pop-up ads on the buying process were also investigated. Pala and Sezgin (2021) found that these advertisements affect the consumer's awareness of needs, alternative evaluation process, and purchasing decision. Yetkin and Basal (2024) stated that pop-ups have a positive effect on brand attitude, while Ristiand and Abdi (2024) stated that they increase customer satisfaction but do not have a direct effect on repurchase decisions. In addition, it has been investigated how factors such as entertainment and informative shape the perception towards pop-up ads. Looking at many studies, pop-up ads are often found to be disturbing, but they have the potential to positively change the perception of consumers in line with their content, timing and advantages. In this study, it was concluded that the participants thought that they could be deceived by pop-up ads and that they could use the internet more efficiently without pop-up ads. It can be stated that these results are due to the problems experienced in the field of cyber security, especially in recent years. Therefore, the participants of the study stated that when they open any site, they close the page without looking at the pop-up ads they encounter. The reason for this is that they find pop-up ads annoying.

In this study, the small sample size (N=142) and its confinement to a single institution limits the generalizability of the findings. However, since the research requested the use of the website as a learning by doing method, the sample was selected in this way.

According to the results of the research, it was determined that the participants of the research were less likely to buy the products they saw in the pop-up advertisement. These results are stated in the literature as entertaining pop-up ads are perceived positively and disturbing ones are perceived negatively. It has also been revealed that pop-up ads with low informative aspects are found to be more disturbing. In addition, it has been suggested that factors such as timing, duration, content compliance, and informational value can reduce the perception of pop-up ads as intrusive (Edwards et al., 2002; Katuwandeniya and Abeywardana, 2019; Hanbazazh and Reeve, 2021). It is important to keep these situations in the foreground in new studies to be carried out.

With this research, users were provided with user experience (UX) in the field of e-commerce. The user experience (UX) provided in the research is a strong example of the "learning to do" method as a process. In this sense, this research is important as it concerns different disciplines such as software development, design, business and marketing. It can be stated that less research has been done with the "learning to do" method in the literature compared to other studies (Le and Vo, 2017; Hsieh et al., 2021; Willermark et al., 2021).

Individuals' attitudes towards the types of pop-ups used on shopping sites also differ according to their demographic characteristics. Variables such as gender and income level guide the behavior of individuals. In the results of the study, it was observed that there was no statistically significant difference between male participants and female participants in terms of their attitudes towards pop-up ads. In addition, there is no significant difference between the monthly expenditure amounts of the participants and their opinions on the types of pop-ups used on shopping sites. In new studies, it may be suggested that different situations can be seen and different demographic questions should be included.

According to the results of the research, the study provides general information and sets an example for future research. For new studies to be conducted, researchers may be advised to conduct studies on similar topics that can be supported by qualitative analysis methods.

In the shopping website developed by the researchers in this research, a modern and useful interface was designed. In new research to be conducted by the researchers, it can be suggested that they prepare websites using artificial intelligence tools. In this way, the effect of e-commerce and artificial intelligence on users can be examined.

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Appendix-1:

Survey Questions Used in the Research

Demographic Questions

Gender: Female... Male...

Monthly Expenditure:

1000 - 1500 TL... 1500 - 2000 TL... 2000- 2500 TL... 2500 - 3000 TL... 3000 TL - over...

Attitudes Regarding the Use of Pop-ups

1. When I open any site, I close the pop-up ad that appears without looking.
2. I'm intrigued by pop-up ads.
3. I don't want to buy the product I see the pop-up ad for.
4. I installed blocking programs on my internet access devices due to pop-up ads.
5. I have a negative perspective towards the company whose pop-up ad I see.
6. I find pop-up ads annoying.
7. I think that the products in pop-up ads are of poor quality.
8. I immediately close the website where I see pop-up ads.
9. I have purchased the product I saw in the pop-up ad at least once.
10. I think I can be deceived by pop-up ads.
11. I turn off the tool from which I access the internet due to pop-up ads.
12. If there were no pop-up ads, I would use the internet more efficiently.

Research Article

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Comparison of Agility Perception Between Industrial and Service Sectors[1]

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Abstract

In recent years, organizational agility has become one of the most crucial elements for success and sustainability in increasingly competitive global markets. Agility refers to businesses' ability to adapt to rapidly changing market conditions and is recognized as an important performance indicator in both industrial and service sectors. The significance of agility performance and capability as a competitive element has attracted interest from both business and academic worlds, becoming the subject of numerous studies. However, how the perception of agility differs between industrial and service sectors hasn't been adequately examined.

Agility is a capability that can significantly positively impact the competitive power that businesses need strategically. However, the agility phenomenon doesn't depend solely on a business's intentions and efforts. External factors affecting business can influence agility perception. One of these is the sector in which the business operates and this sector's characteristics and structure.

This research examines agility perceptions of businesses in industrial and service sectors and investigates differences stemming from sectoral characteristics. The study considered data collected through surveys from 341 upper and middle-level managers of companies operating in the Istanbul region, including 145 service and 196 industrial businesses. The collected data underwent reliability, frequency, descriptive, and t-test analyses.

The research found that agility perception differs based on the operational sector ($t=3.429$ $p=0.001<0.05$). Accordingly, service sector businesses (Mean=4.06) have a higher agility perception compared to industrial sector businesses (Mean=3.85). These results reveal that agility perception in the service sector is at a higher level than in the industrial sector.

Keywords: Agility, Competition, Competitive Power, Service Sector.

JEL Codes: L20, L80, L60

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1. Introduction

Agility is a concept associated with the ability of organizations and teams to respond to change. However, there are significant differences in how responses are formulated and their content across different sectors. These differences can primarily be attributed to varying priorities stemming from the nature of processes and value chains within each sector (Sharifi & Zhang, 1999).

The service sector has a dynamic structure focused on customer interactions and experiences. Here, agility is critical for accurately perceiving customer needs, responding quickly, developing original service solutions, and enhancing customer satisfaction. Businesses can improve service processes by adopting agile approaches and becoming more responsive to customer demands and expectations.

The industrial sector differs from the service sector due to its focus on physical production processes and technological infrastructure. In this context, agility in the industrial sector concentrates on innovative production models that optimally combine machinery and human resources in a flexible structure, as well as factors like efficiency, supply chain management, and cost control. Agile structures in the industrial sector must continuously strive for development and innovation to effectively use resources and increase production efficiency. For this reason, agility in the industrial sector isn't limited to production processes but also encompasses product development and marketing strategies.

Recent research by Pelletier et al. (2025) emphasizes that manufacturing small and medium-sized enterprises (SMEs) need to align at least one dynamic IT capability (sensing, learning, coordinating or integrating) and one operational IT capability (IT management, IT infrastructure or e-business) to achieve high levels of agility through their digital transformation (Pelletier, L'Écuyer, & Raymond, 2025). This finding highlights the critical role of digital capabilities in enhancing organizational agility, particularly in the manufacturing sector.

In the rapidly changing service sector, agility significantly contributes to innovation and increased customer satisfaction, while in more stable sectors, it can serve fundamental goals such as operational excellence and cost reduction (Tallon and Pinsonneault, 2011).

Furthermore, Alakaş (2024) demonstrates that digital transformational leadership and organizational agility have positive effects on digital transformation, with digital strategy mediating these relationships (Alakaş,2024). This research underscores the interconnected nature of leadership, agility, and digital transformation across different organizational contexts.

In conclusion, there are distinct differences in the implementation of agility—a critical element for businesses' future success—between service and industrial sectors, in line with their own dynamics and requirements (Buldum and Görener, 2022). How this concept takes shape in both sectors is of great importance for sustainable growth, adaptation, and gaining competitive advantage.

2. Concept of Agility and Organizational Agility

Agility is an important capability that allows businesses to respond quickly to dynamic and changing market conditions and customer demands and to successfully maintain their existence, and it is influenced by factors such as sector dynamics, organizational structure, employee motivation (Buldum and Görener, 2022; Akkaya and Tabak, 2018). Agility is the flexibility, speed, and adaptation ability that businesses demonstrate against change. Businesses' ability to gain competitive advantage by rapidly adapting to especially variable, uncertain market conditions and customer demands significantly depends on their agility (Sharifi & Zhang, 1999, p. 10).

Recent systematic literature review by Asghar et al. (2025) reconceptualizes organizational agility as a multidimensional construct comprising contextual factors, fundamental attributes, vital enablers, and dynamic capabilities, rather than a singular construct. This comprehensive framework distinguishes between macro-agility (strategic and partnering agility) and micro-agility (operational, innovation, and workforce agility), providing a more nuanced understanding of organizational agility (Asghar, Kanbach, & Kraus, 2025).

Sharifi and Zhang (1999) emphasize that businesses should have characteristics such as flexibility, speed, competence, and responsiveness, which are critical for increasing their agility. The ability to rapidly restructure processes and structure to use business resources more effectively is expressed as flexibility. The capacity to offer products and services at a time that will provide superiority over competitors is expressed as speed. Competence is the ability of businesses to provide high-quality products and services. The ability of businesses to respond quickly to customer demands and market changes can be expressed as responsiveness.

Christopher (2000), Desalegn and colleagues (2024) have stated that agility is not only the capacity to respond quickly to customer demands and changes in the market, but also the sum of various strategies including proactive change management, the ability to evaluate opportunities, and development. Alkandi & Helmi (2024) stated that agility requires advanced product and service design and production in order to gain flexibility against market fluctuations, and that competitive advantage can only be achie-

ved with such a strategy. Cristofaro et al. (2025) emphasized that organizational agility is a critical factor not only for short-term adaptation responses but also for adaptation to long-term changes.

Agile organizations need to have three fundamental elements: flexibility, speed, and customer focus. In this context, flexibility is the ability to adapt quickly to demand fluctuations and unexpected changes. Speed is the delivery of products and services to the market and customer in different ways in accordance with customer expectations. Customer Focus is structuring all processes by centering on customer wishes and expectations (Christopher, 2000, p. 39).

Agile organizations structured in this way stand out with demand orientation, short cycle times resulting from strategies based on predictable time planning, and flexible production structure. Moving away from the supply-oriented understanding in traditional organizations, demand orientation is adopted in agile structures. Short cycle times, which characterize agile organizational structures, enable the shortening and acceleration of supply, product development, and delivery times. Flexible Production is having the ability to rapidly restructure production processes as required by the market (Christopher, 2000, p. 41).

Agile organizational structures provide important advantages that will increase the strategic competitive power of businesses. To list these advantages (Christopher, 2000);

- Competitive Advantage: Agile organizations have an important sensitivity regarding focus on customer demands. Therefore, they can differentiate from their competitors by better perceiving customer wishes and demands and responding quickly.
- Customer Satisfaction: Agile organizations can better meet customer needs. This will enable the business to expand its customer base.
- Risk Management: Agile organizations are more sensitive to potential risks.
- Evaluating Market Opportunities: Agile organizations can quickly evaluate new market opportunities.
- Use of Information Technologies: The most important feature of agile formations is that they have effective information sharing and data processing systems. Current information technologies are utilized to the maximum extent to accelerate information sharing and increase its transparency. This strengthens organizational communication and flexibility.
- Supplier Cooperation: The stability of supply processes is extremely important. For this, it is necessary to cooperate with reliable suppliers. Flexible organizational structures have flexible, fast, and stable processes by working closely with suppliers.
- Demand Forecasting: It is important to meet customer demands uninterruptedly, quickly, and with the desired quality to ensure customer satisfaction and gain competitive advantage. Agile organizational structures use analytical methods to accurately predict customer demands and expectations.
- Flexible Production Systems: It is the adoption of the flexible production method for the rapid restructuring of production to adapt to the expectations of the market and the customer (Christopher, 2000).

Canpolat (2011) addressed the leadership behaviors of managers and defined the technical, human, and conceptual skills necessary for effective management. In this context, the role of managers in creating agile organizations and their leadership styles have an impact on employee motivation. The role of managers in an agile organizational structure, their adoption of a supportive leadership approach, is important in increasing organizational agility. In this context, agility requires managers at every level, from strategic to operational, to display a dynamic approach, focusing on innovation, efficiency in resource use, flexibility, and accurate decision-making. The manager's possession of these skills not only increases the business's ability to respond more quickly to market demands but also supports the formation of results such as continuous improvement, cooperation, creating value at the highest level, and increased productivity.

The role of digital transformational leadership has become increasingly critical in the modern business environment. Alakaş (2024) demonstrates that digital transformational leadership significantly influences organizational agility through digital transformation processes, with digital culture and digital strategy serving as key mediating factors (Alakaş, 2024). This finding emphasizes that contemporary leaders must not only possess traditional leadership skills but also digital competencies to effectively guide their organizations through digital transformation initiatives.

Ak (2018) emphasized the effects of increasing employee motivation and strengthening organizational identity on creating an agile structure and stated that the efforts of professional managers to create more flexible organizational structures resistant to competitive processes create a vital necessity in environments of uncertainty and change (Ak, 2018).

On the other hand, agility is not just a managerial approach, but also a cultural phenomenon. Therefore, the successful implementation of agility depends on the adoption of a mirroring understanding and organizational culture that will support agility by the business. Creating an organizational culture that will support agility is related to developing employee talents, empowering teams, and adopting new business models.

As a strategy that responds to the rapidly changing dynamics of the business world, digital transformation is also closely related to agility. Investments in rapidly developing autonomous technologies and digital transformation come to the fore in organizations' increasing agility and making their processes more efficient ((Mrugalska & Ahmed, 2021). Digital transformation involves restructuring core processes with digital technologies and changing organizational culture. With digital transformation, the integration of innovations such as data analytics, cyber-physical systems, big data and analytical cloud computing, artificial intelligence, and the internet of things that reshape business processes is ensured, thereby strengthening the abilities to make quick decisions, understand customer expectations, and respond more flexibly to market demands ((Mrugalska & Ahmed, 2021). Additionally, the efficiency provided by digital tools helps reduce costs and shorten product development times.

Recent research by Pelletier et al. (2025) provides empirical evidence that manufacturing SMEs must strategically align their IT capabilities to achieve organizational agility. The study reveals that organizations need to combine at least one dynamic IT capability (such as sensing, learning, coordinating, or integrating) with one operational IT capability (IT management, IT infrastructure, or e-business) to be highly agile. This configurational approach to IT capabilities highlights the complexity of digital transformation processes and their impact on organizational agility (Pelletier, L'Écuyer, & Raymond, 2025).

Mrugalska & Ahmed, (2021) state that agile organizational structures are needed for Industry 4.0 technologies because with the adoption of Industry 4.0 technologies by companies, it becomes possible to deal more effectively with environmental changes affecting the business. Also, the adoption of Industry 4.0 technologies by organizations can significantly increase their agility capabilities (Mrugalska & Ahmed, 2021).

Industry 4.0 refers to the integration of digitalization and automation into organizational structures. Industry 4.0 technologies can increase the agility capability of organizations with the contribution created in the following areas (Mrugalska & Ahmed, 2021):

- Quick Decision Making: Big data analysis and artificial intelligence enable faster and more accurate decisions.
- Flexibility: IoT and robotic systems make it possible to rapidly restructure production systems.
- Customer Focus: Digital technologies make a strong contribution to better understanding customer needs and responding quickly to these needs.
- Innovation: Industry 4.0 offers comprehensive product development and improvement services.

Atienza-Barba et al. (2024) stated that artificial intelligence has become a critical tool for agile structures in the post-pandemic period. They stated that artificial intelligence verification makes it possible for businesses to respond more quickly to possible changes by accelerating data analytics and automatic decision-making processes.

Digital transformation offers important opportunities for the agility of industrial and service sector businesses. While using digital technologies with automation and robot technologies to optimize production processes, reduce error rates, and for effective inventory management in the industrial sector, it creates opportunities to offer more personalized services by improving customer experiences in the service sector (Teece et al., 1997, p.516).

The digital transformation process not only includes technological updates but also reevaluates ways of doing business with a flexible and collaborative understanding. Thus, when businesses realize digital transformation, they not only use their existing resources efficiently but also gain significant competitive power to open up to new markets.

Therefore, digital transformation means increasing flexibility in the development of agility in service and industrial sectors, optimizing production processes by supporting innovative processes, and customer-oriented solutions (Sambamurthy, Bharadwaj, and Grover, 2003). The adaptation abilities of businesses are directly related to the success of this transformation. A successful digital transformation strategy contributes to businesses meeting current demands and increasing their resilience in the face of future uncertainties.

In another study conducted by Çelikdin (2022), the performance indicators of industrial agile businesses were addressed. The study emphasized the role of agility in businesses gaining competitive advantage and ensuring sustainability (Çelikdin, 2022). In this context, it was concluded that the perception of agility is an important factor in businesses achieving their strategic goals.

Sustainability is another critical element in the strategies of agile organizations. Increasing environmental concerns and social responsibility awareness cause businesses to be sensitive to green practices. In this context, sustainability transformation strategies emerge as elements that support agility and create both customer loyalty and competitive advantage.

Global competition is another determining factor in agility strategies. Agility has an important role in businesses gaining competitive advantage and ensuring sustainability (Çelikdin, 2022). Nguyen and colleagues (2024) stated that in businesses with high levels of agility, financial performance, innovation, and competitive advantage increase. Agile businesses can have high competitive power by using their resources more effectively and maintain their leading positions against their competitors. Busi-

nesses need solutions that will continuously increase innovation and strengthen adaptation to survive in local and international markets. In this context, agility becomes critical in terms of rapidly adapting to changing market conditions, presenting innovative solutions, and increasing their ability to remain competitive.

Mrugalska & Ahmed, (2021) state that the integration of current digital technologies (IoT, artificial intelligence, robotics) into business processes increases agility and creates competitive advantage. In this way, businesses adapt to changing conditions flexibly and quickly, and their ability to take advantage of opportunities and eliminate threats that arise in the business environment increases. The ability to make faster decisions, respond more quickly to market changes, and evaluate customer feedback is provided by correct technology integration.

Cost management is also one of the important benefits provided by agility. Including agile methodologies (such as Scrum and Kanban) in business processes increases resource utilization efficiency, workforce performance, and reduces costs. Agile organizations have the capacity to develop innovative solutions. They can offer products and services more suitable for customer needs by continuously making innovations in business processes. This creates a competitive advantage for the business. Competitive advantage is businesses gaining a certain superiority in the market. Agile organizations have a competitive advantage over their competitors in the market (Dove, 2001; Yusuf et al., 1999). This effect of agility on creating competitive advantage is a noteworthy area of study, especially in the service and industrial sectors. Agility requires responding quickly to changing market conditions, providing timely appropriate solutions to customer demands, and adopting innovative approaches. This quality provides businesses with a flexible structure, making it possible for them to take less risk while competing. Especially in the high-tempo service sector, companies can accelerate their product development processes by responding instantly to customer feedback; in this context, efforts to ensure consumer satisfaction contribute to long-term profitability by creating a loyal customer base.

3. Agility in the Service Sector

In service sector businesses, agility capability is obtained through customer focus, entrepreneurship, and flexible organizational structures. In this context, agility plays a critical role in customer relations and market strategies (Buldum and Görener, 2022). Service sector businesses must continuously restructure their service processes with a customer-focused agility understanding (Ciampi et al., 2022).

Teece and colleagues (1997) revealed the business dynamics that affect agility for service sector businesses. The first of these is Perceiving Customer Needs. Service businesses should be able to quickly perceive customers' needs and offer services suitable for these needs. The second is the restructuring of service processes in line with agile organization principles when necessary. Service businesses can adapt to market conditions by rapidly restructuring their processes. The third is the development of innovative service models. Service businesses can gain competitive advantage by developing innovative service models (Teece et al., 1997, p. 520).

Agility in service sector businesses requires having the ability to respond quickly and effectively to the competitive pressure created by constantly changing market conditions and customer demands. Agile service sector businesses that offer customer-focused and personalized service should establish a feedback mechanism to develop innovative approaches and flexible service models (Sharifi and Zhang, 1999, p.15) and strategies that will restructure business processes, and should continuously analyze the feedback obtained.

Technology use is one of the most important driving forces of agility in service sector businesses. Verma and Boyer (2000) associated agility in the service sector with customer focus, speed, and digital transformation. An agility approach in this sense requires having the ability to respond quickly to customer demands and increase flexibility in service processes. Technologies such as cloud computing, data analytics, and artificial intelligence offer flexibility, speed, and opportunities for sector businesses to provide personalized services that meet customer expectations. Especially with automation technologies, repetitive tasks can be performed, allowing employees to focus on more creative work. Besides, digital platforms can create opportunities for customer interaction and reaching large audiences.

Industry 4.0 approaches in the service sector increase agility by supporting customer focus and digital transformation processes. Industry 4.0 technologies in the service sector have a significant area of influence on customer focus and digital transformation. In services; artificial intelligence, IoT, and big data analytics can be used to better understand customer needs and to provide services suitable for these needs and create a positive customer experience. Besides, digital technologies allow services to be restructured very quickly (Mrugalska & Ahmed, 2021).

The effective use of data analytics and communication technologies in service sector businesses increases the ability to predict customer demands, provide personalized services, and respond quickly to customer demands (Akkaya and Tabak, 2018). This situation, especially in the service sector, not only meets customer demands quickly and increases ser-

vice quality but also strengthens the reputation of the brand, loyalty to the brand, and is critical in terms of increasing customer satisfaction.

Due to the nature of the service sector, it needs rapid change and adaptation abilities the most. Besides, it is important to have flexibility, innovative, and quick accurate decision-making abilities because the products offered are not tangible and customer interactions are one-to-one and generally face-to-face. Because, factors that affect customer satisfaction in the service sector are related not only to the quality of the service provided but also to the flexibility of the service and its timely, rapid delivery (Sambamurthy et al., 2003, p. 245).

Digitalization and the changing technology environment are causing a complete reinterpretation of service sector dynamics. Elements such as the spread of e-services, the development of mobile applications, and data analytics are transforming service delivery and radically redefining customer interactions (Sambamurthy et al., 2003, p. 245). The integration of these new technologies into the sector deeply affects not only the internal functioning of businesses but also external customer relations, thus becoming the key to agility in the sector.

The impact of agility differs in various parts of the service sector. While agility stands out as a strategic necessity in dynamic and competitive sectors (such as software or technology sector), the advantages of agility may remain more limited in more stable sectors (such as traditional manufacturing) (Nadkarni and Narayanan, 2007). Although the strategic importance of agility varies in different segments of the service sector, practices that will ensure that customer needs are met and the speed of meeting them is better than competitors in each different sector segment are critical in terms of obtaining agility and competitive advantage.

4. Agility in the Industry Sector

In the industrial sector, agility plays a critical role in increasing the efficiency of the supply chain and the effectiveness of production processes. Companies that adopt an agile production system have the ability to rapidly restructure their production processes according to variable market conditions. Agility not only offers an operational advantage but also strengthens the market perception of the brand. As a result, the competitive advantage provided by agility is not limited to the optimization of internal processes but also forms the key to long-term success by leading to transformation in the general strategies of companies.

In the industrial sector, agility is important for gaining competitive advantage by quickly adapting to changes in the market. Production processes of agile industrial businesses require the design of flexible and modular models (Kisperska-Moron and Swierczek, 2009). Teece, Pisano, and Shuen (1997) emphasize that restructuring dynamic capabilities that include existing organizational resources can enable adaptation to changing conditions and gain competitive advantage. Additionally, the study states that industrial businesses should consider three basic processing dynamics in achieving organizational agility. The first of these is Restructuring Production Processes. Industrial businesses can adapt to customer demands by rapidly restructuring their production processes. Another is adopting technological innovations. Industrial businesses can gain competitive advantage by adopting new technologies and utilizing these new technologies. Finally, supply chain management. The design of an effective supply chain is an important factor that increases the profitability and competitive power of the business (Teece et al., 1997, p. 515).

Agile industrial businesses are built on basic principles such as flexible structuring, rapid reorganization, and continuous improvement that will enable increasing the adaptation ability of the workforce, adapting to customer demands by rapidly restructuring production processes, increasing diversity, and responding instantly to demand changes, and this is only possible by focusing on technological developments (Sharifi & Zhang, 1999, p. 10).

Structuring the supply chain is an important factor for increasing vitality in industry. Close cooperation with suppliers is an important factor that will ensure the rapid restructuring of the supply chain (Sharifi & Zhang, 1999, p. 10). Each stage of the supply chain covers interconnected processes to respond quickly and effectively to customer demands. Supply chain managers aim to optimize the value flow by using resources efficiently and flexibly, from production to distribution, from inventory management to recycling, to achieve corporate flexibility.

An important component of agility in the industrial sector is the ability to quickly adapt to new technologies (Li et al., 2023). On the other hand, supply chains should be digitalized structures based on flexible and dynamic strategies in increasing agility. Digitalization accelerates critical decision-making processes through real-time data flow and analysis methods in supply chains. In this way, effective management of resources and uninterrupted continuity of production processes are ensured.

Automation technologies are important components that strengthen agility in the industrial sector and form the backbone of the sector. Automation systems transform traditional systems, reducing human errors in the production process. Robot technologies and artificial intelligence applications increase the usage efficiency of workforce and resources and production performance (Ajiga et.al., 2024).

One of the ways to increase the agility of production processes is the integration of lean production principles into business processes. The basic com-

ponents of Lean Six Sigma; waste reduction, process improvement, customer focus, data-driven decision making create opportunities for businesses in both industrial and service sectors to quickly adapt to customer demands and market conditions ((Rosa & Broday, 2018). This approach, by increasing the agility of the production process and the entire organization, accelerates response times, reduces costs, and significantly improves market reach speed and customer satisfaction. Additionally, the use of data analytics and digital technologies strengthens rapid decision-making mechanisms by increasing the traceability and controllability of production processes.

5. Methodology

5.1. Research Design and Ethics

This study employs a quantitative research approach using survey methodology to examine agility perceptions between industrial and service sectors. The research design follows a cross-sectional comparative study framework to investigate sectoral differences in agility perception among businesses operating in the Istanbul region.

Ethics Statement: This research was conducted in accordance with ethical research principles. Prior to data collection, ethical approval was obtained from the Ethics Committee of the İstanbul Gedik University. All participants were informed about the purpose of the study, and their voluntary participation was ensured. The confidentiality and anonymity of all responses were guaranteed, and participants were informed of their right to withdraw from the study at any time. The study complies with the Declaration of Helsinki and relevant ethical guidelines for research involving human subjects.

5.2. Sample and Data Collection

The study considered data collected through surveys from 341 upper and middle-level managers of companies operating in the Istanbul region. The sample consisted of 145 service sector businesses and 196 industrial sector businesses. The selection of Istanbul as the research location was based on its significance as Turkey's largest economic center, hosting a diverse range of both industrial and service sector companies.

The questionnaire used as a data collection tool consists of two main parts: Demographic Questions: Questions including demographic information of the participants such as education level and position of employee, type of enterprise, enterprise size, field of the enterprise. Agility Scale: The agility scale developed by Liu et al. (2018) and consisting of 8 questions was used (Liu, et al., 2018). The survey questions were designed to be answered using Likert-type scale (1=Strongly disagree, 5=Strongly agree). During the data collection process, the questionnaire form was sent to the participants via e-mail using online platforms and in printed form. The data collection process took approximately three months and 341 valid responses were received during this period.

5.3. Data Analysis

The collected data underwent several analytical procedures:

Reliability Analysis: Cronbach's alpha coefficients were calculated to assess the internal consistency of the measurement scales.

Frequency Analysis: Descriptive statistics were computed to understand the distribution of responses and sample characteristics.

Descriptive Analysis: Mean scores, standard deviations, and other descriptive measures were calculated for both sectors.

Independent Samples t-test: This statistical test was employed to compare agility perceptions between industrial and service sectors, testing for significant differences between the two groups.

5.4. Hypothesis of Research

Many studies have been conducted to identify variables and parameters that affect agility in industrial and service sector businesses. The studies of Yusuf, Sarhadi, and Gunasekaran (1999) and Gunasekaran et al. (2018) emphasized that the main driving force of agility in industrial businesses is flexibility in production processes and integration of information technologies. Karakaya and Aydın (2014) and Özdemir and Aydın (2012) stated in their studies that agility in the service sector is associated with the ability to respond quickly to customer needs and customization. Şahin and Kılıç (2016) and Daghfous and Amara (2010) emphasized in their studies that agility in industrial businesses provides operational efficiency and cost advantage. Karakaya and Aydın (2014) stated in their studies that agility in the service sector increases customer satisfaction and service quality.

The studies of Sambamurthy, Bharadwaj, and Grover (2003) and Overby et al. (2006) emphasized the relationship between the effect of information technologies on agility, customer experience management in service businesses, and supply chain integration in industrial businesses, showing that information technologies have different application areas in both sectors. Daghfous and Amara (2010) emphasized the relationship between agility in industrial businesses and lean production and automation applications, stating that agility in industrial businesses is supported by lean production and automation applications.

The studies of Karakaya and Aydın (2014) and Sambamurthy et al. (2003) investigated the relationship between agility and digital transformation processes in service businesses. The study of Gunasekaran et al. (2018) investigated the relationship between agility and supply chain flexibility in industrial businesses, showing that agility in industrial businesses is directly related to supply chain flexibility. The studies of Karakaya and Aydın (2014) and Özdemir and Aydın (2012) investigated the relationship between agility and innovative service delivery in service businesses, emphasizing that agility in the service sector is associated with innovative service delivery.

In the studies mentioned above, it is seen that many different aspects related to agility have been researched. This research was conducted to understand the differences in agility practices of industrial and service businesses and to provide a reference for developing agile organizational structures. For this purpose, the hypothesis of the research was developed by utilizing the findings in the literature and placed in a theoretical framework. The following hypothesis was proposed for the research:

H1: Businesses' agility practices differ according to the industrial and service sectors.

6. Findings

6.1. Confirmatory Factor Analysis

Confirmatory Factor Analysis is used to analyze the structural validity of the scale used in the research and creates the opportunity to explore the compatibility of the data collected for the research with the original structure. In this context, Confirmatory Factor Analysis (CFA) was applied to ensure the validity of the Agility Scale, which consists of a single dimension and 8 items. In terms of data model fit, covariances were gradually created between items 6-7, 7-8, 4-5, and 1-2 that showed error similarity. As a result, the new model fit indices obtained were within the limits specified in the literature (Kline,2015; Byrne, 2010). The analysis results are shown in Table 1. and the CFA diagram is shown in Figure 1.

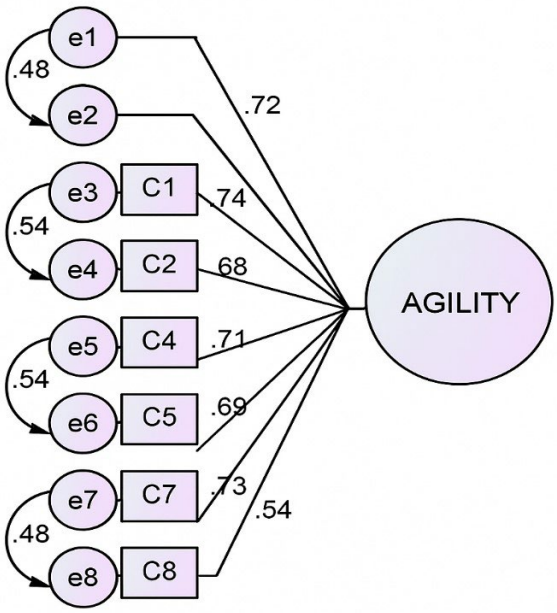

Figure 1. CFA Diagram of Agility Scale

Table 1. Agility Scale Model Fit Indexes

Fit Index	Category	Acceptable Fit	Perfect Fit	Obtained Value	Fit Status
χ^2/df	General Fit	≤ 4-5	≤ 3	2.96	Perfect
CFI	Comparative Fit	≥ 0.95	≥ 0.97	0.980	Perfect
NFI	Comparative Fit	0.90-0.94	≥ 0.95	0.970	Perfect
IFI	Comparative Fit	0.90-0.94	≥ 0.95	0.980	Perfect
RMSEA	Absolute Fit	0.06-0.08	≤ 0.05	0.067	Acceptable
GFI	Absolute Fit	0.85-0.89	≥ 0.90	0.973	Perfect

When Table 1 is examined, the general fit of the scale (χ^2/df = 2.96) is at an acceptable level, falling within the recommended range of ≤ 4-5 for acceptable fit (Hu & Bentler, 1999). Additionally, among the comparative fit indices, CFI (0.980), NFI (0.970), and IFI (0.980) show excellent fit according to Hu and Bentler's (1999) stringent criteria of ≥ 0.97, ≥ 0.95, and ≥ 0.95, respectively. The RMSEA (0.067) shows acceptable fit, falling within Browne and Cudeck's (1993) reasonable fit range of < 0.08. Finally, the absolute fit index GFI (0.973) demonstrates excellent fit, exceeding the ≥ 0.90 threshold recommended by Hu and Bentler (1999). Accordingly, the validity of the Agility Scale consisting of a single dimension and 8 statements has been confirmed.

6.2. Reliability Analysis

Reliability refers to the ability of measurement tools in a research to produce consistent results when reused. Therefore, reliability analysis is a critical factor in determining the validity and accuracy of data in experimental and field studies.

The Cronbach Alpha (α) technique is widely used to determine the reliability level in research. Accordingly, the α value takes a value between 0 and 1, and values of minimum 0.7 and above are considered to have high internal consistency and reliability indicators (Nunnally and Bernstein, 1994: 275-280). In this context, the Cronbach Alpha value was calculated to determine the reliability of the agility scales. The obtained result is shown in Table 2.

Table 2. Reliability Analysis Results

Scale/Size	Number of items	α
Agility Scale	8	0,828

When Table 2. is analyzed; it is determined that the agility scale is highly reliable with an alpha coefficient of 0.828.

6.3. Demographic Findings

Frequency analysis was conducted to determine the educational status of the participants. The findings obtained as a result of the analysis are given below.

6.4. Education Status

The educational status of the participants is shown in Table 3.

Table 3. Educational Status

	N	Percentage%	Cumulative Percentage (%)
Bachelor's and Associate's degree	159	46,6	46,6
Master's Degree	117	34,3	80,9
PhD	65	19,1	100,0
Total	341	100,0	

46.6% (159 people) of the participants are undergraduate and associate degree graduates, 34.3% (117 people) have master's degrees, and 19.1% (65 people) have doctoral degrees. Since the research was conducted on managers, it is expected that their educational levels are high. Additionally, the fact that a group with high educational status and in managerial positions constitutes the research sample significantly supports the quality of the research findings.

Table 4. Position of the Employee

	N	Percentage%	Cumulative Percentage (%)
Senior Manager	227	66,6	66,6
Mid-Level Manager	114	33,4	100,0
Total	341	100,0	

When Table 4.6. is analyzed, 33.4% of the participants, 114 of them are middle level managers and 66.6%, 227 of them are senior managers. This reveals the suitability of the sample for strategic level information to be obtained about the business.

Table 5. Type of Enterprise

	N	Percentage%	Cumulative Percentage (%)
Business Operating on an International Scale	162	47,5	47,5
Large Scale Enterprise	72	21,1	68,6
Small and Medium Enterprises - SMEs	79	23,2	91,8
Micro Scale Firm or Sole Proprietorship	28	8,2	100
Total	341	100,0	

When Table 5. is examined, 47.5% of the enterprises operating on an international scale are 162 enterprises, while 21.1% are large-scale, 72 enterprises. Of the international enterprises, 31 are not considered large-scale enterprises. Small and medium-sized enterprises are 23.2%, 79 enterprises, micro-sized and sole proprietorships are 8.2%, 28 enterprises. Of the enterprises within the scope of the research, 40.5%,

Table 6. Enterprise Size

	N	Percentage%	Cumulative Percentage (%)
Small and Medium Enterprises	138	40,5	40,5
Large Scale Enterprise	203	59,5	100,0
Total	341	100,0	

138 enterprises are small and medium-sized enterprises and 59.5%, 203 enterprises are large-scale enterprises.

Table 7. Field of Activity of the Enterprise

	N	Percentage%	Cumulative Percentage (%)
Service Sector	145	42,5	42,5
Industry Sector	196	57,5	100,0
Total	341	100,0	

Of the enterprises within the scope of the research, 42.5%, 138 service enterprises and 57.5%, 196 industrial enterprises.

6.5. Normality Statistics

Skewness and kurtosis are two important measures used to evaluate the distribution of data. These measures describe the extent to which the distribution of a data set deviates from the central tendency and the general shape of that distribution. Skewness refers to the symmetry of the data distribution and kurtosis refers to whether the top of the data distribution is high or flat. The fact that the skewness and kurtosis coefficients are between ±1.0 values indicates that the distribution is normal (George and Mallery, 2018:114-115).

Table 8. Skewness and Kurtosis Values of Agility Data

Scale/Size	Skewness		Kurtosis	
	Statistics	Standard Error	Statistics	Standard Error
Service Sector	-0,250	0,201	0,310	0,400
Industry Sector	-0,154	0,174	0,515	0,346

The skewness and kurtosis values of the agility scales shown in Table 8 indicate a normal distribution.

6.6. Comparison of Agility in terms of Activity Sector Variables

Independent Sample T test was applied to determine whether Agility differs in terms of Activity Sector Variable. The results of the analysis are shown in Table 10 and descriptive statistics values according to sectors are shown in Table 9.

Table 9. Descriptive Statistics for Sectors

In which sector does your company operate?		N	Average		Average	Standard Deviation	Standard Error
			Max	Min			
Agility	Service	145	5	2,75	4,0586	,51519	0,04278
	Industrial	196	5	2,50	3,8501	,60495	0,04321

The lowest average of the agility scale for the Service Sector is 2.75; the highest average is 5.0; the general average is 4.0586 and the standard deviation is 0.515. This indicates that the agility perceptions of the service sector are at a high level.

In the industrial sector, the lowest average of the agility scale is 2.50; the highest average is 5.0; the general average is 3.85 and the standard deviation is 0.60495. This indicates that agility in the industrial sector is at a high level.

As a result, when examining the descriptive statistics of the industrial and service sectors, it is seen that the agility perception of the service sector is higher than in the industrial sector.

Table 10. Independent Sample T-test Analysis Results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Agility	Equal variances assumed	4,083	,044	3,348	339	,001	,20849	,06228	,08599	,3309
	Equal variances not assumed			3,429	332,287	,001*	,20849	,06081	,08888	,3281

*P is valid P<0.05

When Table 10 is analyzed; it is determined that agility differs in terms of the sector of activity (t=3,429 p=0,001<0,05). Accordingly, the agility perception of the service sector (Mean=4.06) is higher than that of the industrial sector (Mean=3.85). These results indicate that agility is at a higher level in the service sector than in the industrial sector.

7. Discussion and Conclusion

7.1. Discussion

The findings of this study contribute to the growing body of literature on organizational agility by providing empirical evidence of sectoral differences in agility perception. The results align with theoretical expectations that service sector organizations, due to their inherent characteristics and operational requirements, tend to perceive themselves as more agile compared to their industrial counterparts.

The multidimensional nature of organizational agility, as conceptualized by Asghar et al. (2025), provides a theoretical framework for understanding these sectoral differences. The distinction between macro-agility (strategic and partnering agility) and micro-agility (operational, innovation, and workforce agility) may explain why service sector organizations, with their emphasis on customer interaction and rapid service delivery, demonstrate higher agility perceptions (Asghar et al., 2025)

The dynamics of the industrial and service sectors each create a significant impact on the development of sectoral structures and business models. Understanding the differences between the two sectors plays a critical role in developing strategies that will increase success while developing agile approaches for businesses. The recognition of agility as a capability that shapes the future of the business world is important for the sustainability of ongoing competition in both service and industrial fields.

The differentiation of agility according to service and manufacturing sectors was done with data collected from managers in 341 companies in the manufacturing and service sectors. As a result of the analysis conducted with the collected data, it was determined that it differs between industrial and service sectors, and it was concluded that agility in the service sector is at a higher level compared to the industri-

al sector. In the service sector, quick response and flexibility to customer demands can change continuously and in shorter periods are at the forefront. According to the findings of the study, the service sector is stronger than the industrial sector, especially in responding quickly to customer demands. These findings show that agility in the service sector is significantly associated with practices that increase customer satisfaction (Vargo & Lusch, 2008).

The higher agility perception in the service sector can be attributed to several factors that are inherent to service operations. First, service organizations typically operate with direct customer interaction, necessitating rapid response capabilities to meet evolving customer expectations (Vargo & Lusch, 2008). This customer-centricity creates organizational structures that prioritize flexibility and adaptability as core competencies rather than secondary capabilities (Teece, 2018).

Brozovic (2016) argues that service organizations develop "dynamic service capabilities" that enable them to reconfigure their service delivery processes rapidly in response to changing market conditions. These capabilities are embedded in organizational routines that emphasize customer feedback loops and continuous service innovation. Our findings support this theoretical perspective, demonstrating that service sector managers perceive their organizations as more agile compared to their industrial counterparts.

The intangible nature of services also contributes to greater organizational agility. Unlike manufacturing processes that require significant capital investment in physical assets, service processes can often be reconfigured with minimal structural changes (Menor et al., 2002). This inherent flexibility allows service organizations to pivot more rapidly when market conditions change, supporting the higher agility perception observed in our study (Sherehiy et al., 2007).

Digital transformation has further amplified the agility advantage in service organizations. As noted by Nambisan et al. (2019), digital technologies enable service firms to develop modular service architectures that can be rapidly reconfigured to meet changing customer needs. The integration of cloud computing, data analytics, and artificial intelligence has created what Huang et al. (2017) term "digital service agility" the ability to leverage digital technologies to sense and respond to market changes with unprecedented speed and precision.

The relatively lower agility perception in the industrial sector can be understood through the lens of structural inertia theory (Hannan & Freeman, 1984) and the concept of path dependency (David, 1985). Industrial organizations typically operate with capital-intensive production systems that create significant switching costs when changes are required. This structural rigidity can impede rapid adaptation to changing market conditions, resulting in lower perceived agility (Bustelo et al., 2006).

Gunasekaran et al. (2018) identify several factors that constrain agility in manufacturing contexts, including complex supply chains, high capital investment requirements, and lengthy product development cycles. These factors create what Teece (2018) terms "complementary asset constraints" the need to align multiple interdependent systems when implementing changes. Our findings suggest that these constraints may contribute to the lower agility perception observed in industrial organizations.

However, it is important to note that industrial sector agility, while lower than service sector agility, still registered at a high level (Mean=3.85). This suggests that industrial organizations are actively developing agility capabilities despite structural constraints. Yusuf et al. (2014) argue that manufacturing organizations are increasingly adopting "leagile" approaches that combine lean efficiency with agile responsiveness. These hybrid approaches enable industrial organizations to develop context-specific agility capabilities that address their unique operational challenges (Narasimhan et al., 2006).

The emergence of Industry 4.0 technologies presents significant opportunities for enhancing agility in industrial contexts. As noted by Mrugalska & Ahmed (2021), technologies such as the Internet of Things (IoT), artificial intelligence, and advanced robotics can increase manufacturing flexibility and responsiveness. These technologies enable production systems that can autonomously reconfigure in response to changing demand patterns or supply disruptions.

The findings of this study have several important implications for managers seeking to enhance organizational agility. First, the sectoral differences in agility perception suggest that agility development strategies should be contextualized to address sector-specific challenges and opportunities. Service sector managers should leverage their organizations' inherent flexibility while focusing on systematizing agility practices to ensure consistency across the organization (Sherehiy et al., 2007).

Industrial sector managers face the challenge of overcoming structural constraints on agility. Adopting modular production architecture, as recommended by Bustelo et al. (2006), can enhance manufacturing flexibility without sacrificing efficiency. Additionally, developing what Gunasekaran et al. (2018) term "agile supply chains" collaborative networks of suppliers that can rapidly reconfigure in response to changing demand—can enhance overall organizational agility.

Digital transformation represents a critical priority for managers across both sectors. As noted by Nambisan et al. (2019), digital technologies enable organizations to develop "digital options"IT-enabled ca-

pabilities that create strategic flexibility. Managers should prioritize investments in digital technologies that enhance sensing capabilities (e.g., advanced analytics), seizing capabilities (e.g., digital platforms), and reconfiguring capabilities (e.g., cloud computing).

Organizational culture plays a crucial role in agility development. Sherehiy et al. (2007) identify several cultural attributes that support organizational agility, including tolerance for uncertainty, empowerment of front-line employees, and continuous learning orientation. Managers should foster these cultural attributes through leadership behaviors, reward systems, and organizational structures that encourage experimentation and rapid adaptation.

Cross-functional collaboration represents another critical enabler of organizational agility. As noted by Tallon et al. (2019), organizations with strong cross-functional integration demonstrate higher agility by facilitating rapid information sharing and coordinated responses to market changes. Managers should implement mechanisms such as cross-functional teams, integrated information systems, and collaborative decision-making processes to enhance organizational agility.

While this study provides valuable insights into sectoral differences in agility perception, several limitations should be acknowledged. First, the study focused on organizations in the Istanbul region, potentially limiting the generalizability of findings to other geographic contexts. Future research should examine agility differences across diverse geographic and cultural contexts to develop a more comprehensive understanding of contextual influences on agility development.

Second, the study relied on managerial perceptions of organizational agility rather than objective measures of agility performance. While perceptual measures provide valuable insights into organizational capabilities, they may be subject to social desirability bias and other response biases (Podsakoff et al., 2012). Future research should complement perceptual measures with objective indicators of agility performance, such as new product development cycle times, market response times, and adaptation to disruptive events.

Third, the cross-sectional design of this study limits causal inferences regarding the relationship between sectoral characteristics and agility development. Longitudinal research designs would provide stronger evidence regarding the development trajectories of agility capabilities across different sectoral contexts. Additionally, case study research could provide deeper insights into the specific mechanisms through which sectoral characteristics influence agility development.

Future research should also explore the relationship between organizational agility and performance outcomes across different sectoral contexts. While existing research suggests that agility contributes to superior performance (Tallon & Pinsonneault, 2011), the strength of this relationship may vary across sectors due to differences in competitive dynamics and customer expectations. Understanding these contingencies would provide valuable guidance for managers regarding the strategic value of agility investments.

The role of digital transformation in enhancing organizational agility represents another promising direction for future research. As noted by Nambisan et al. (2019), digital technologies are transforming the nature of organizational capabilities, including agility. Future research should examine how specific digital technologies contribute to different dimensions of organizational agility across sectoral contexts, providing guidance for targeted technology investments.

7.2. Implications

The service sector's dynamic structure, focused on customer interactions and experiences, naturally requires higher levels of responsiveness and flexibility. Service organizations must continuously adapt to changing customer preferences, market conditions, and competitive pressures. This constant need for adaptation may contribute to a heightened awareness and perception of agility within service organizations.

In contrast, industrial sector organizations, while equally capable of agility, may face different constraints and requirements that influence their agility perception. The physical nature of production processes, longer product development cycles, and capital-intensive operations may create different agility challenges and opportunities.

The role of digital transformation in enhancing organizational agility cannot be overlooked in this discussion. Alakaş (2024) demonstrates that digital transformational leadership and organizational agility have synergistic effects on digital transformation success, with digital strategy and digital culture serving as critical mediating factors (Alakaş, 2024). This suggests that organizations in both sectors can enhance their agility through strategic digital transformation initiatives.

The findings have several important implications for managers and practitioners in both sectors:

Organizations should develop sector-specific agility strategies that are tailored to their sector's unique characteristics and requirements. Service sector organizations can leverage their naturally higher agility perception to further enhance their competitive advantage, while industrial sector organizations should focus on identifying and addressing specific barriers to agility.

Digital Transformation Initiatives is very important. Based on the research by Pelletier et al. (2025), organizations, particularly in the manufacturing sector, should strategically align their IT capabilities to enhance agility. This involves combining dynamic IT capabilities (sensing, learning, coordinating, integrating) with operational IT capabilities (IT management, IT infrastructure, e-business) (Pelletier et al., 2025)

Organizations should invest in developing digital transformational leadership capabilities, as these have been shown to significantly impact organizational agility and digital transformation success.

Creating an organizational culture that supports agility is crucial for both sectors. This involves developing employee talents, empowering teams, and adopting new business models that facilitate rapid adaptation to change.

7.3. Conclusion

This study provides empirical evidence that agility perception differs significantly between industrial and service sectors, with service sector organizations demonstrating higher levels of perceived agility. The findings contribute to our understanding of how organizational agility manifests across different sectoral contexts and highlight the importance of sector-specific approaches to agility development.

The integration of recent theoretical developments in organizational agility research, particularly the multidimensional conceptualization and the role of digital transformation, provides a more comprehensive understanding of these sectoral differences. The research demonstrates that organizational agility is not a monolithic concept but rather a complex, multifaceted capability that requires careful cultivation and strategic alignment with organizational and sectoral characteristics (Pelletier, et al., 2025; Alakaş, 2024, Asghar et al., 2025).

The practical implications of these findings suggest that organizations should develop tailored agility strategies that account for their sector's unique characteristics and requirements. Service sector organizations can build upon their naturally higher agility perception to further enhance their competitive advantage, while industrial sector organizations should focus on identifying and addressing specific barriers to agility development.

Furthermore, the critical role of digital transformation in enhancing organizational agility across both sectors cannot be overstated. Organizations must strategically invest in digital capabilities, develop digital transformational leadership competencies, and foster digital cultures that support agility initiatives.

As businesses continue to face increasing uncertainty and rapid change in the global marketplace, the ability to maintain and enhance organizational agility will remain a critical success factor. This study contributes to the growing body of knowledge on organizational agility and provides a foundation for future research and practice in this important area.

The research findings underscore the importance of understanding sectoral nuances in agility perception and development, while also highlighting the universal importance of agility as a strategic capability for organizational success in the contemporary business environment.

7.4. Limitations and Future Research

While this study provides valuable insights into sectoral differences in agility perception, several limitations should be acknowledged. The study was conducted only in the Istanbul region, which may limit the generalizability of findings to other geographic contexts. The cross-sectional nature of the study prevents causal inferences about the relationships between sector type and agility perception. The study relies on perceptual measures of agility rather than objective indicators.

Future research is recommended to consider the following:

Conducting longitudinal research to examine how agility perceptions change over time and in response to various organizational and environmental factors.

Expanding the research to include multiple countries and cultural contexts to enhance generalizability.

Incorporating objective measures of organizational agility alongside perceptual measures to provide a more comprehensive assessment.

Investigating potential mediating factors that might explain the relationship between sector type and agility perception, such as organizational culture, leadership style, and digital maturity.

Finally, future research should explore the micro foundations of organizational agility—the individual-level skills, behaviors, and cognitive processes that collectively constitute organizational agility capabilities. As argued by Teece (2007), understanding these micro foundations is essential for developing effective interventions to enhance organizational capabilities. Research examining how individual agility competencies aggregate to create organizational agility would provide valuable insights for talent management and leadership development.

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Research Article

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Examining the Relationship Between Attitude Towards Artificial Intelligence, Readiness for Change and Intention to Leave[1]

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Abstract

This study examines the relationship between attitudes towards artificial intelligence, readiness for change, and intention to leave. In this study, the relational survey model, which is one of the quantitative research methods, was employed. The sample of the study consists of 159 employees working in the banking sector in Ankara. In the study, a four-part survey form was created using the demographic form developed by the researcher, "Artificial Intelligence Attitude Scale", "Readiness for Change Scale", and "Intention to Leave Scale". The data analysis process was carried out using the SPSS 23 program. The Artificial Intelligence Attitude Scale is quite reliable. According to the research findings, male participants have higher Positive Attitude and Artificial Intelligence Attitude scores compared to female participants; they also stated that they are more open to change. The intention to leave the job of the 21-30 age group is higher than the 51-65 age group. As the income level increases and the level of AI usage increases, the readiness for change scores also increase. Paid users have the highest positive attitude and openness to change. While there is a positive relationship between AI Attitude and Readiness for Change, no significant relationship was found between the Intention to Leave and other variables.

Keywords: Artificial Intelligence, Readiness for Change, Intention to Leave.

JEL Codes: M1

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1. Introduction

The rapid development of artificial intelligence (AI) technologies and their increasing integration into daily life make positive contributions to the quality of life of individuals and make human life easier in many areas. Artificial intelligence, which refers to the cognitive abilities exhibited by machines, is not only a technological revolution, but also a paradigm shift that reshapes the thinking, learning and decision-making processes of individuals (Wirth, 2018). AI research in computer science focuses on the development of systems that can mimic the biological intelligence and behavioural patterns of living things (Farrow, 2019). In this context, AI can be defined as the science and engineering of producing intelligent machines (McCarthy, 2007).

Artificial intelligence is generally considered as a technology that aims to enable machines to perform applications that are specific to human intelligence. When evaluated from a definitional perspective, AI can be expressed as the ability of a computer or robot to perform certain tasks like an intelligent living being. However, there are also approaches that go beyond this definition. According to Dereli (2020), AI is a system that not only accesses information but also learns by analyzing this information, adapts to its external environment and can perform the tasks assigned to it accordingly.

Jain (2018) defined artificial intelligence as "intelligence exhibited by machines, as opposed to human and animal intelligence" and stated that this technology has a structure that imitates the cognitive functions of the human mind, such as problem solving and learning. Looking from another perspective, Boden (2014) underlines that the main purpose of AI is to understand and illuminate mental processes rather than commercial gains.

The ultimate goal of AI studies is to develop systems that can perform human-like thinking, reasoning, learning and decision-making processes. In this context, Salvaris et al. (2018) define artificial intelligence as the effort to produce intelligent machines that have the capacity to simulate intelligence and imitate human behavior. Similarly, Lexcellent (2019) considers this technology as the modeling of human intelligence by computer systems. Norvig (2012) defines AI as the most important general-purpose technology of our age, emphasizing that it has the ability to make the right choice in situations where humans cannot predict what to do. Brynjolfsson & McAfee (2017) state that the power of artificial intelligence comes from its ability to perform tasks with high performance without the need for human intervention and without the need to explain its operating logic in detail.

In this context, understanding individuals' attitudes towards artificial intelligence is very important in terms of analyzing the behavioral tendencies they develop towards the transformations brought about by the mentioned technology. Because individuals' attitudes towards AI are generally shaped by underlying beliefs, value judgments, and cognitive tendencies, and unless this structure changes, attitudes remain permanent (Çöllü & Öztürk, 2006). Especially in a period where radical technological changes such as artificial intelligence are on the agenda, one of the factors that determines the extent to which individuals are ready for this change is their attitudes towards AI (Çöllü & Öztürk, 2006; Çakan & Akın, 2024). Rafferty & Minbashian (2019) reveal that individuals' adaptation behaviors to technological innovations are affected by their perceptions and beliefs about these technologies. It can be said that individuals with positive attitudes approach change processes more openly and flexibly, whereas individuals with negative attitudes tend to resist these processes (Çakan & Akın, 2024).

It is thought that individuals' attitudes towards artificial intelligence are not only limited to their reactions to technological developments but may also be an indicator of the extent to which they are ready for change. The fact that transformative technologies such as artificial intelligence trigger change in many areas, from working styles to social relations, increases the importance of the attitudes and behaviors of individuals towards these transformation processes. Therefore, establishing a meaningful relationship between attitudes towards artificial intelligence and readiness for change plays a critical role in understanding both the individual adaptation process and corporate innovation management. Especially in today's world, where rapid technological transformations are taking place, determining the extent to which individuals are open to such innovations has become a fundamental requirement for the successful adoption of artificial intelligence-based systems.

Today, the dizzying pace of technological developments is transforming the habits of individuals and deeply affecting the operating dynamics of institutions. In particular, increasing investments in research and development activities, easier access to information, and the penetration of digitalization into every aspect of social life make change not only possible but also an inevitable reality. In this context, organizational change brings about radical transformations not only in processes but also in decision-making mechanisms, accountability, and redefinition of the institutional vision (Burke, 2017).

In this era where competition is intense and constant change has become the norm, the survival of organizations depends largely on their success in change

management. However, it is a striking finding in the literature that most change processes do not achieve the desired level of success (Rafferty & Minbashian, 2019). The failure of organizational change efforts is often due to the lack of sufficient consideration of the human factor (Gürbüz & Bayık, 2019). This situation has led researchers to examine in depth the psychological, behavioral and attitudinal factors that affect the success of organizational change.

Especially today, artificial intelligence technologies, which are considered the driving force of change, play a central role in the transformation processes of organizations. In this new era where artificial intelligence-supported applications are radically transforming the way of doing business, the attitudes and psychological reactions of individuals in organizations towards this technology have a direct impact on the success of the change (Elias, 2009; Burke, 2017).

Factors such as employees' job satisfaction, stress level, and intention to leave are directly linked to perceptions and attitudes towards artificial intelligence. In this context, AI-based transformation processes should be evaluated not only with their technical and structural dimensions, but also with the psychological and emotional reactions of individuals (Elias, 2009).

In this context, it can be said that employees' attitudes towards artificial intelligence technologies may affect their level of adaptation to change and therefore, their tendency to leave their jobs. Individuals who view AI as a threat may begin to experience uncertainty about their professional future, which may increase their intention to leave their job. On the other hand, employees who perceive artificial intelligence as an opportunity and a supportive element are more open to change and maintain their level of organizational commitment. Therefore, individual attitudes become a determining factor not only in technological adaptation but also in employees' desire to remain in the organization (Rafferty & Minbashian, 2019).

From a business perspective, retaining qualified employees has become a strategic priority. The loss of talented, experienced employees who contribute to the organization at a high level can result in serious costs not only in terms of human resources but also in terms of knowledge, time and financial resources (Uyguç & Çımrın, 2004). For this reason, businesses should correctly analyze the reasons that trigger employees' tendency to leave their jobs, develop policies to minimize these risks, and carry out change processes with employee-centered approaches (Polat & Meydan, 2010).

In this context, the aim of the research is to examine the effects of individuals' attitudes towards artificial intelligence technologies on their readiness for change and intention to leave their job. The importance of the research lies in understanding the attitudes of individuals towards artificial intelligence and the dimensions of these attitudes related to openness to change and intention to leave the job in order to make organizational change sustainable in the process of rapid digitalization. It is thought that these findings will contribute to the shaping of human resources policies and the development of change management strategies in a human-oriented manner in both public and private sector organizations.

The hypotheses of this research are as follows:

- H1: The attitudes of banking sector employees towards artificial intelligence differ according to demographic factors (gender, age, education level, household income status, length of service in the sector, use of paid artificial intelligence products).
- H2: The readiness of banking sector employees for change varies according to demographic factors (gender, age, education level, household income level, length of service in the sector, use of paid artificial intelligence products).
- H3: The intentions of banking sector employees to leave their jobs vary according to demographic factors (gender, age, education level, household income level, length of service in the sector, use of paid artificial intelligence products).
- H4: There is a statistically significant relationship between the attitudes of banking sector employees towards artificial intelligence and their readiness for change.
- H5: There is a statistically significant relationship between the attitudes of banking sector employees towards artificial intelligence and their intention to leave their job.
- H6: There is a statistically significant relationship between the readiness for change of banking sector employees and their intention to leave their jobs.

2. Method

2.1. Research Model

In this study, the relational screening model, which is within the scope of quantitative research methods, was used. The model in question is defined as a screening design that allows the determination and interpretation of relationships between multiple variables (Şimşek, 2012). The model of the research is shown in Figure 1.

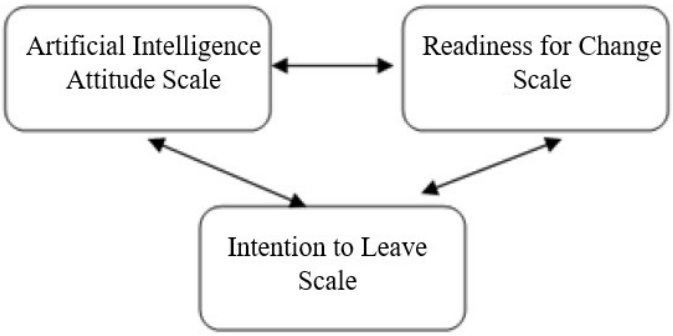

Figure 1. Research Model

2.2. Universe and Sample

The population of the study consists of employees working in the banking sector in Ankara. The main reason for conducting the research in the banking sector is that it has a structure in which intense work tempo, high stress level and customer relations are at the forefront. The sample of the study consists of 159 employees working in the banking sector in Ankara. The sample size was determined based on a 95% confidence level. Simple random sampling method was preferred in selecting the sample.

2.3. Data Collection Tools

In the study, a survey form consisting of four sections was created using the demographic form developed by the researcher, the "Artificial Intelligence Attitude Scale", the "Readiness for Change Scale" and the "Intention to Leave Scale". These scales are as follows;

Artificial Intelligence Attitude Scale: The "Computer Attitude Scale", which was developed by Nickell & Pinto (1986) and aimed to measure individuals' attitudes and beliefs towards computers, was updated and re-adapted by Durndell & Haag (2002) in the following years as the "Internet Attitude Scale". This adaptation aimed to expand the scope of the scale in parallel with technological developments and to evaluate attitudes towards internet use. This scale was translated into Turkish as "Artificial Intelligence Attitude Scale" by Çakan & Akın (2024) in line with technological developments. The scale consists of two sub-dimensions that aim to measure positive and negative attitudes towards artificial intelligence and contains a total of 12 items. A 5-point Likert-type measurement system is used for participants to rate their opinions.

Readiness for Change Scale: The "Readiness for Change" scale developed by Rafferty & Minbashian (2019) was designed to assess individuals' readiness levels for organizational change. This scale was adapted into Turkish and made available by Çakan & Akın (2024). The single-dimensional scale contains a total of 5 items and a 7-point Likert-type rating system is used to measure the attitudes of the participants.

Intention to Leave Scale: The scale developed by Reychav & Weisberg (2009) was created to measure individuals' attitudes and tendencies towards a specific issue. The scale in question was adapted to Turkish by Büyükbeşe (2012) and made suitable for use in the local context. The single-dimensional scale contains a total of 8 items, and a 5-point Likert-type scaling method is used to rate participants' opinions.

2.4. Analysis of Data

The data analysis process was carried out using the SPSS 23 program. Firstly, Cronbach's Alpha coefficient was calculated to evaluate the reliability of the scales used. The conformity of the data to normal distribution was tested before moving on to difference analyses; parametric test methods were preferred in the analyses in line with the findings obtained. In order to determine significant differences between scale scores according to demographic variables, t-test and one-way analysis of variance (ANOVA) for independent samples were used. Correlation analysis was applied to reveal the level and direction of the relationships between the scales.

2.5. Reliability Analysis

Cronbach's Alpha coefficient is one of the basic reliability indicators used to evaluate the internal consistency of a scale and takes values between 0 and 1. In the interpretation of this coefficient, the following ranges are generally taken into account: 0.00–0.40 indicates low reliability, 0.40–0.60 indicates limited reliability, 0.60–0.80 indicates a highly reliable structure, and 0.80–1.00 indicates a high level of reliability (Tavşancıl, 2005). In this context, Cronbach's Alpha coefficient is considered an important criterion in determining the consistency and reliability of the scale on the structure it measures.

Table 1 . Reliability Analysis

	Items	Cronbach's Alpha
Negative Attitude	7	0.937
Positive Attitude	5	0.936
Artificial Intelligence Attitude Scale	12	0.778
Readiness for Change Scale	5	0.974
Intention to Leave Scale	8	0.919

The table presents the Cronbach Alpha coefficients obtained within the scope of reliability analyses of the scales used and their sub-dimensions. According to the values obtained; Positive Attitude and Negative Attitude sub-dimensions, Readiness for Change Scale and Intention to Leave Scale were found to be highly reliable. Artificial Intelligence Attitude Scale has a generally very high level of reliability.

Table 2. Personal Information

		n	%
Gender	Female	88	55.3
	Male	71	44.7
Age	21-30	14	8.8
	31-40	26	16.4
	41-50	62	39.0
	51-65	57	35.8
Education Status	High School	6	3.8
	Associate Degree	11	6.9
	Bachelor's Degree	83	52.2
	Postgraduate	59	37.1
Household Income Status	Less than 30.000 TL	6	3.8
	Between 30.001-40.000 TL	9	5.7
	Between 40.001-50.000 TL	22	13.8
	Over 50.000 TL	122	76.7
Duration of Employment in the Sector	1 year or less	16	10.1
	2-5 years	8	5.0
	6-10 years	12	7.5
	11-15 years	18	11.3
	16 years and over	105	66.0
Use of Paid Artificial Intelligence Products	None	75	47.2
	I use the free versions	64	40.3
	I have a paid membership	20	12.6

Table 2 shows the distribution of participants' personal characteristics. 55.3% of the participants are female and 44.7% are male. The most densely populated age group is the 41-50 age group with 39.0%, followed by the 51-65 age group with 35.8%. 52.2% of the participants have a bachelor's degree, 37.1% have a postgraduate degree, 6.9% have an associate's degree, and 3.8% have a high school degree. When looking at household income, it is seen that the vast majority (76.7%) have an income of over 50.000 TL. When the distribution of participants in terms of their working years in the sector is examined, it is striking that 66.0% have 16 years or more of experience. This group is followed by 11.3% with 11-15 years and 10.1% with 1 year or less of experience. When looking at the status of using paid artificial intelligence products, 47.2% of the participants stated that they do not use any artificial intelligence products, 40.3% use only free versions, and 12.6% have paid memberships.

3. Findings

Table 3. Descriptive Statistics

	avg.	sd.	min.	max.	skewness	kurtosis
Negative Attitude	21,45	7,55	7	35	0,004	-0,724
Positive Attitude	16,55	5,77	5	25	-0,454	-0,648
Artificial Intelligence Attitude Scale	38,00	8,27	19	60	0,557	0,467
Readiness for Change Scale	20,62	8,52	5	35	-0,087	-1,081
Intention to Leave Scale	19,03	7,94	8	40	0,67	-0,068

Skewness and kurtosis values were calculated to determine the conformity of the data related to the scales and their sub-dimensions to normal distribution. According to the widely accepted approach in the literature, when these values are between -2 and +2, it is interpreted that the data are normally distributed (Hopkins & Weeks, 1990; De Carlo, 1997). As a result of the analysis, the relevant values of all scales and their sub-dimensions are within this range and it is accepted that the data are normally distributed. In this direction, parametric test methods were used in statistical analyses.

Table 4. Comparison of Scale and Sub-Dimension Scores in Terms of Participants' Gender

	Female		Male		t	p
	avg.	sd.	avg.	sd.		
Negative Attitude	20,94	7,53	22,08	7,57	-0,948	0,345
Positive Attitude	15,67	5,93	17,63	5,42	-2,156	0,033*
Artificial Intelligence Attitude Scale	36,61	7,28	39,72	9,11	-2,333	0,021*
Readiness for Change Scale	19,30	8,45	22,25	8,38	-2,203	0,029*
Intention to Leave Scale	19,14	7,68	18,89	8,30	0,196	0,845

Table 4 shows the independent sample t-test results for comparing the Positive/Negative Attitude sub-dimension scores, Artificial Intelligence Attitude Scale, Readiness for Change Scale and Intention to Leave Scale scores according to the gender of the participants. In terms of Positive Attitude, male participants had significantly higher scores than female participants. Male participants also had significantly higher scores than female participants in the total score of the Artificial Intelligence Attitude Scale. A significant difference was also found in the scores of the Readiness for Change Scale according to gender. Male participants had higher scores indicating that they were more open and ready for change. No significant difference was found in the Negative Attitude sub-dimension and Intention to Leave scales according to gender.

Table 5. Comparison of Scale and Sub-Dimension Scores in Terms of Participants' Ages

	21-30		31-40		41-50		51-65		F	p
	avg.	sd.	avg.	sd.	avg.	sd.	avg.	sd.		
Negative Attitude	22,43	8,98	22,23	6,39	20,74	7,84	21,63	7,46	0,360	0,782
Positive Attitude	15,71	7,10	18,04	5,06	17,19	5,25	15,37	6,15	1,717	0,177
Artificial Intelligence Attitude Scale	38,14	9,81	40,27	8,94	37,94	8,53	37,00	7,21	0,933	0,426
Readiness for Change Scale	21,93	8,40	23,04	7,77	20,50	8,70	19,32	8,62	1,264	0,289
Intention to Leave Scale	24,07	7,39	20,27	5,74	18,40	8,47	17,89	7,97	2,695	0,048*

Table 5 shows the ANOVA test results for comparing the Positive/Negative Attitude sub-dimension scores, Artificial Intelligence Attitude Scale, Readiness for Change Scale and Intention to Leave Scale scores of the participants according to their age groups. In line with the findings, a statistically significant difference was found only in the Intention to Leave Scale scores according to the age variable.

Participants in the 21-30 age group had significantly higher scores on the Intention to Leave Scale compared to those in the 51-65 age group.

When the Negative Attitude and Positive Attitude sub-dimensions and the Artificial Intelligence Attitude Scale and Readiness for Change Scale scores were examined, it was seen that there was no statistically significant difference between age groups. This finding reveals that individuals, regardless of their age, show similar tendencies in their attitudes towards artificial intelligence and their levels of openness to change.

Table 6. Comparison of Scale and Sub-Dimension Scores in Terms of Participants' Educational Status

	High School		Associate Degree		Bachelor's Degree		Postgraduate		F	p
	avg.	sd.	avg.	sd.	avg.	sd.	avg.	sd.		
Negative Attitude	23,67	10,42	22,18	4,94	21,64	7,15	20,83	8,25	0,275	0,842
Positive Attitude	14,67	7,28	13,91	5,96	16,10	5,53	17,86	5,75	2,220	0,088
Artificial Intelligence Attitude Scale	38,33	10,73	36,09	4,46	37,73	7,90	38,69	9,12	0,362	0,781
Readiness for Change Scale	12,33	10,05	18,45	7,87	21,28	7,78	20,93	9,17	2,381	0,072
Intention to Leave Scale	13,50	6,95	21,09	6,89	19,04	7,88	19,19	8,21	1,231	0,300

Table 6 shows the ANOVA test results for comparing the Positive/Negative Attitude sub-dimension scores, Artificial Intelligence Attitude Scale, Readiness for Change Scale and Intention to Leave Scale scores according to the participants' educational status. As a result of the analysis, no statistically significant difference was found in terms of all variables according to the level of education ($p>0.05$).

Table 7. Comparison of Scale and Sub-Dimension Scores in Terms of Household Income Status of Participants

	Less than 30.000 TL		Between 30.001-40.000 TL		Between 40.001-50.000 TL		Over 50.000 TL		F	p
	avg.	sd.	avg.	sd.	avg.	sd.	avg.	sd.		
Negative Attitude	19,33	9,85	25,11	7,96	19,73	8,18	21,60	7,26	1,268	0,287
Positive Attitude	17,00	7,13	14,44	6,00	15,64	5,83	16,84	5,71	0,696	0,556
Artificial Intelligence Attitude Scale	36,33	9,67	39,56	9,74	35,36	6,68	38,44	8,34	1,051	0,372
Readiness for Change Scale	15,00	10,58	19,00	8,94	16,64	8,82	21,73	8,09	3,422	0,019*
Intention to Leave Scale	21,17	10,74	22,33	7,04	22,00	9,03	18,14	7,53	2,255	0,084

Table 7 shows the ANOVA test results for comparing the Negative Attitude sub-dimension, Positive Attitude sub-dimension, Artificial Intelligence Attitude Scale, Readiness for Change Scale and Intention to Leave Scale scores according to the household income status of the participants.

According to the findings, a statistically significant difference was found in the Readiness for Change Scale scores ($p=0.019$). In terms of the Readiness for Change Scale, a significant difference was found between individuals in the 40.001–50.000 TL income group and individuals with an income of 50.000 TL

and above.

When the Negative Attitude and Positive Attitude sub-dimensions and the Artificial Intelligence Attitude Scale and the Intention to Leave Scale scores were examined, it was determined that there was no statistically significant difference depending on the income level ($p > 0.05$). This situation reveals that the participants did not show a significant difference in their attitudes and tendencies towards the variables in question according to their income levels.

Table 8. Comparison of Scale and Sub-Dimension Scores in Terms of Participants' Working Time in the Sector

	1 year or less		2-5 years		6-10 years		11-15 years		16 years and over		F	p
	avg.	sd.	avg.	sd.	avg.	sd.	avg.	sd.	avg.	sd.		
Negative Attitude	21,50	8,41	24,88	6,10	23,17	7,47	21,83	6,09	20,92	7,76	0,701	0,592
Positive Attitude	15,19	6,87	19,13	5,94	16,92	5,70	16,06	5,27	16,60	5,71	0,662	0,619
Artificial Intelligence Attitude Scale	36,69	9,91	44,00	7,43	40,08	9,35	37,89	8,91	37,52	7,74	1,450	0,220
Readiness for Change Scale	20,31	9,60	24,25	6,09	19,42	9,09	24,22	7,96	19,90	8,45	1,433	0,226
Intention to Leave Scale	24,56	7,72	21,50	7,05	17,92	5,50	19,22	7,74	18,09	8,04	2,679	0,034*

Table 8 shows the ANOVA test results comparing the Positive/Negative Attitude sub-dimension scores, Artificial Intelligence Attitude Scale, Readiness for Change Scale and Intention to Leave Scale scores of the participants according to their length of service in the sector. According to the analysis findings, a significant difference was found only in the Intention to Leave Scale scores. Intention to Leave Scale scores were significantly higher in participants who had been working in the sector for 1 year or less than in participants with 16 years or more experience.

Table 9. Comparison of Scale and Sub-Dimension Scores in Terms of Participants' Use of Paid Artificial Intelligence Products

	None		I use the free versions		I have a paid membership		F	p
	avg.	sd.	avg.	sd.	avg.	sd.		
Negative Attitude	20,01	7,28	21,73	7,86	25,95	5,70	5,227	0,006*
Positive Attitude	15,28	5,19	17,33	5,63	18,80	7,32	4,066	0,019*
Artificial Intelligence Attitude Scale	35,29	6,96	39,06	7,73	44,75	10,04	10,137	0,000*
Readiness for Change Scale	16,33	7,34	23,56	7,14	27,25	8,75	25,334	0,000*
Intention to Leave Scale	18,16	8,02	20,75	7,90	16,75	6,91	2,843	0,061

Table 9 shows the ANOVA test results for comparing the Negative Attitude sub-dimension, Positive Attitude sub-dimension, Artificial Intelligence Attitude Scale, Readiness for Change Scale and Intention to Leave Scale scores according to the participants' use of paid artificial intelligence products. Accordingly, significant differences were found in the Negative Attitude sub-dimension, Positive Attitude sub-dimension, Artificial Intelligence Attitude Scale and Readiness for Change Scale ($p<0.05$).

A significant difference was observed in Negative Attitude scores. The negative attitude scores of paid AI users are significantly higher than those who do not use AI. The difference is also significant in terms of Positive Attitude. Paid users have higher positive attitude scores than non-users. Significant differences were found between all groups in the total score of the AI Attitude Scale. It is observed that as the level of AI use increases, attitude scores also increase. The highest average is in the group with

paid membership. The Readiness for Change Scale scores differ significantly between the groups. Paid users exhibit a profile that is more open to change compared to both free users and non-users. In terms of the Intention to Leave Scale, the difference is quite close to the significance level, but it is not statistically significant. However, the striking point is that this scale score is seen as the highest in the free user group and the lowest in the paid user group.

Table 10. Correlation Analysis of Scale and Sub-Dimension Scores

		Negative Attitude	Positive Attitude	Artificial Intelligence Attitude Scale	Readiness for Change Scale	Intention to Leave Scale
Negative Attitude	r	-				
	p					
Positive Attitude	r	-,252**				
	p	0,001				
Artificial Intelligence Attitude Scale	r	,737**	,469**			
	p	0,000	0,000			
Readiness for Change Scale	r	,301**	,392**	,549**		
	p	0,000	0,000	0,000		
Intention to Leave Scale	r	0,028	0,077	0,080	0,091	-
	p	0,722	0,332	0,316	0,253	

**: p<0,01

Table 10 shows the results of the Pearson correlation analysis conducted to determine the relationships between the scales and their sub-dimensions. The correlation coefficients obtained reveal the direction and strength of the relationship between the variables. According to Yazıcıoğlu & Erdoğan (2014), the value of the Pearson correlation coefficient is an important criterion in interpreting the level of relationship. Accordingly, if the correlation coefficient is in the range of 0.00–0.25, the relationship is considered very weak, in the range of 0.26–0.49, it is considered weak, in the range of 0.50–0.69, it is considered moderate, in the range of 0.70–0.89, it is considered high, and in the range of 0.90–1.00, it is considered very high. This classification provides a basic reference for understanding the strength of the relationship between variables. Accordingly;

It was determined that there was a weak, positive and statistically significant relationship between the Negative Attitude and the Readiness for Change Scale ($r = 0.301$; $p < 0.001$). This finding shows that individuals with negative attitudes can still be open to change to a certain extent. Similarly, a weak, positive and significant relationship was found between the Positive Attitude and the Readiness for Change Scale ($r = 0.392$; $p < 0.001$). This result indicates that individuals who develop a positive attitude towards artificial intelligence are more ready for change processes. The relationship between the Artificial Intelligence Attitude Scale and the Readiness for Change Scale was found to be moderate, positive and statistically significant ($r = 0.549$; $p < 0.001$). This shows that positive attitudes towards artificial intelligence in general increase the level of individuals' adoption of change. On the other hand, no statistically significant relationship was found between the Intention to Leave Scale and the Artificial Intelligence Attitude Scale and its sub-dimensions ($p > 0.05$). Similarly, no statistically significant relationship was found between the Intention to Leave Scale and the Readiness for Change Scale ($p > 0.05$). These results reveal that the intention to leave does not show a direct relationship with the other variables examined.

4. Conclusion and Discussion

In this section, statistical analyses regarding the findings obtained within the scope of the research are presented and the relationships between the variables are evaluated in detail.

In terms of Positive Attitude, male participants scored significantly higher than female participants. This shows that male participants have a more positive attitude towards AI. Male participants also scored significantly higher than female participants in the total score of the AI Attitude Scale. This finding shows that male participants generally have a more positive and accepting perspective towards AI.

This result is consistent with similar studies in the literature. For example, Çankaya (2024) and Kandemir & Azizoğlu (2024) stated that male individuals have a more positive attitude towards artificial intelligence compared to females. Similarly, Figueiredo (2019), Zhang & Dafoe (2019), Sindermann et al. (2022), and Fietta et al. (2021) also found that men have a more accepting and positive perspective towards tech-

nological innovations. These findings suggest that gender is an effective variable in shaping attitudes towards technology.

On the other hand, it was found that male participants received significantly higher scores than female participants in terms of the Readiness for Change Scale. This shows that male individuals are more open and prepared for innovations and technological transformations. However, this finding contradicts some studies. For example, Helvacı & Kıcıroğlu (2010) and Levent (2016) stated that gender does not have a significant effect on readiness for change. This difference may be due to the professional, cultural or demographic characteristics of the study groups, or it may be related to the transformation of technological awareness and social roles over time.

Participants in the 21-30 age group have significantly higher scores on the Intention to Leave Scale than those in the 51-65 age group. This finding shows that individuals in the younger age group have a stronger intention to leave their jobs. It is thought that individuals, especially those in their early career period, may be more likely to be open to alternative job opportunities, re-evaluate career development, or leave their current jobs due to fluctuations in job satisfaction. This finding is consistent with the existing literature. Lewis (1991) and Khanin (2013) stated that older employees are less likely to leave their jobs than their younger counterparts. Similarly, Cho & Song (2017) emphasized that individuals' intention to leave decreases as the time they spend in their organization increases, meaning that tenure has a negative effect on intention to leave. In this respect, it can be said that variables such as age and seniority play an important role in determining the tendency to leave the job.

According to the research findings, no statistically significant difference was found between age groups in terms of Negative Attitude, Positive Attitude, Artificial Intelligence Attitude Scale and Readiness for Change Scale scores. This result conveys that the attitudes of individuals in different age groups towards artificial intelligence and their levels of readiness for change are largely similar. This result is similar to some studies. For example, Çankaya (2024) did not find any significant difference depending on the age variable in terms of the Positive and Negative Attitude sub-dimensions and the total score of the Artificial Intelligence Attitude Scale. Similarly, Yakut (2024) and Elsayed & Sleem (2021) did not find statistically significant differences in attitudes towards artificial intelligence between age groups. Şentürk & Köklü (2013) also stated that age is not a determining variable in terms of readiness for change. On the other hand, the literature on this subject is not homogeneous. In particular, some studies show that younger individuals have a more positive attitude towards artificial intelligence. A study conducted by YouGov (2023) in the USA determined that the group that uses artificial intelligence tools such as ChatGPT most intensively is between the ages of 18-29. Similarly, Swed et al. (2022) found that the majority of individuals aged 21–30 had a positive approach towards AI. Kandemir & Azizoğlu (2024) emphasized that the positive attitude scores of individuals aged 45 and over were significantly lower compared to younger age groups. In addition, Sabra et al. (2023) found that nurses aged 25–35 had more positive attitudes, while those aged 35 and over had more negative attitudes. When looking at the relationship between the age variable and readiness for change, Er (2013) and Levent (2016) stated that young individuals are more open to change and that this situation is inversely proportional to age. Such results suggest that factors such as digital literacy, adaptability and openness to innovation, which are inherent in technological transformations, work in favor of young individuals. In conclusion, although no significant age-related difference was observed in this study, the findings in the literature provide various evidence suggesting that especially young individuals develop more positive attitudes towards artificial intelligence technologies and change.

As a result of the analyses performed, it was determined that there was no statistically significant difference according to the level of education in terms of all variables examined. It can be said that this result reveals that individuals' attitudes towards artificial intelligence and their levels of openness to change are similar regardless of their academic qualifications. This result is consistent with some national and international studies. For example, Kandemir & Azizoğlu (2024) and Çankaya (2024) did not find a significant relationship between attitude scales towards artificial intelligence and education level. Similarly, in a study conducted in Lebanon, Doumat et al. (2022) stated that there was no significant difference between individuals' academic levels and their attitude scores towards artificial intelligence. In terms of readiness for change, Levent (2016) revealed that the level of education was not a determining factor. On the other hand, some studies present results that partially contradict these findings. For example, in the study conducted by Akyazı (2023) with white-collar workers in Aksaray, while no significant difference was found in terms of education level in the Negative Attitude sub-dimension, it was found that the positive attitude scores of undergraduate graduates were higher than those of primary and secondary school graduates. Similarly, in the study conducted by Yakut (2024) in Ankara, it was determined that individuals with postgraduate education had higher positive attitudes towards artificial intelligence compared to primary school graduates.

According to the research results, a significant difference was found in terms of the Readiness for

Change Scale scores according to the income levels of the participants. In particular, it was determined that individuals in the income group of 50.000 TL and above were more ready for change compared to individuals with incomes in the range of 40.001–50.000 TL. This situation shows that income level can have an impact on the openness of individuals to innovations and transformations. The fact that individuals embrace change more easily as income level increases can be explained by the fact that they have structural advantages such as financial security, education and access to technology. Individuals in higher income groups are likely to be more flexible and motivated to follow and adapt to technological developments, resulting in a higher level of readiness for change.

No significant difference was found in the Negative Attitude sub-dimension, Positive Attitude sub-dimension, Artificial Intelligence Attitude Scale and Intention to Leave Scale variables according to income level. This result reveals that individuals' attitudes towards artificial intelligence and their intention to leave their jobs are similar regardless of their income level. This finding is consistent with some studies in the literature. In fact, in the research conducted by Yakut (2024), no significant difference was found between the Artificial Intelligence Attitude Scale and its sub-dimensions and the income levels of individuals. This indicates that the level of economic well-being may not be a determining factor on the perception and attitudes of individuals towards technology.

The Intention to Leave Scale scores are significantly higher among participants who have been working in the sector for 1 year or less than those with 16 years or more experience. This finding shows that those who are new to the sector have a higher intention to leave, and this intention decreases as they gain experience. It can be thought that individuals, especially those at the beginning of their professional lives, are more likely to leave their jobs due to reasons such as not yet having fully formed institutional ties, low job satisfaction, or reshaping their career expectations. This finding is also consistent with the existing literature. In fact, studies conducted by Selçuk & Seren (2024) and Boz (2024) have revealed that individuals who are new to the sector have a higher intention to leave their jobs. This situation shows that factors such as uncertainty, difficulty in adaptation and unfulfilled expectations experienced in the early stages of business life can make individuals more prone to question their current jobs.

In the studies conducted by Selamat et al. (2021), Swed et al. (2022), Kandemir & Azizoğlu (2024) and Çankaya (2024), no statistically significant relationship was found between attitudes towards artificial intelligence and length of service in the sector. These findings show that individuals' attitudes towards artificial intelligence are shaped independently of professional seniority. Similarly, in the research conducted by Levent (2016), it was stated that there was no significant difference between readiness for change and sectoral experience. In this respect, it can be said that individual responses to technological developments and institutional changes are determined not only by professional experience but also by factors such as personal characteristics, education, level of exposure to technology and individual attitudes.

A significant difference was observed in Negative Attitude scores. Paid AI users had significantly higher negative attitude scores than non-AI users. This finding suggests that active users may also carry critical or cautious views towards technology. The difference is also significant in terms of Positive Attitude. Paid users have higher positive attitude scores compared to non-users. This shows that individuals who interact with AI more evaluate the technology more positively. Significant differences were found among all groups in the total score of the Artificial Intelligence Attitude Scale. It is observed that as the level of artificial intelligence use increases, attitude scores also increase. The highest average is in the group with paid membership. The findings are consistent with the studies in the literature. For example, Çankaya (2024) stated that individuals who have knowledge about artificial intelligence have higher positive attitudes, but there is no significant difference in terms of negative attitudes. Similarly, Karacan Doğan et al. (2023) also revealed that participants with higher general knowledge levels develop more positive attitudes towards artificial intelligence. These results show that the level of interaction and knowledge with artificial intelligence technologies is an important determinant of individual attitudes.

The scores on the Readiness for Change Scale differ significantly between the groups. Paid users exhibit a profile that is more open to change compared to both free users and non-users. This finding shows that individuals with access to digital technologies are generally more open to innovation. In terms of the Intention to Leave Scale, the difference is very close to the significance level, but it is not statistically significant. However, it is noteworthy that this scale score is highest in the free user group and lowest in the paid user group. This can be interpreted as individuals who work more integrated with technology may be more committed to their jobs.

A weak positive and significant relationship was found between Negative Attitude and Readiness for Change Scale ($r = 0.301$; $p < 0.001$). A weak positive and significant relationship was found between Positive Attitude and Readiness for Change Scale ($r = 0.392$; $p < 0.001$). A moderately positive and significant relationship was found between Artificial Intelligence Attitude Scale and Readiness for Change

Scale ($r = 0.549$; $p < 0.001$). This finding shows that general attitudes towards artificial intelligence are a stronger determinant of openness to change. A positive general perspective towards artificial intelligence technologies enables individuals to adopt innovations more easily and be more willing to adapt. The findings are consistent with some studies in the literature. Çakan & Akın (2024) revealed in their study that there is a positive and significant relationship between attitudes towards artificial intelligence and individuals' readiness for change. This finding shows that individuals who develop a positive attitude towards technological developments also exhibit a profile that is more open to change. Similarly, Rafferty & Minbashian (2019) stated that individuals' beliefs about change are one of the basic antecedents of readiness for change and emphasized that these beliefs are directly related to the technological adaptation process. In addition, in the research conducted by Irimia-Diéguez et al. (2023), it was stated that the positive attitudes of employees towards innovative technologies significantly increase the intention to adopt and use these technologies. These findings show that attitudes have an impact not only on perceptual levels but also on behavioral tendencies.

There was no statistically significant relationship between the Intention to Leave Scale and the Artificial Intelligence Attitude Scale and its sub-dimensions ($p>0.05$). Accordingly, it is thought that individuals' attitudes towards artificial intelligence do not have a direct determining effect on their intention to leave their jobs. However, this result differs from some studies in the literature. In fact, in the study conducted by Kılıç (2023), it was revealed that there was a low-level but positive and statistically significant relationship between employees' awareness of artificial intelligence and their intention to leave their jobs. This finding suggests that the integration of AI technologies into business processes may be associated with factors such as uncertainty, job loss anxiety, or task changes for some employees. Similarly, Li et al. (2019) found a significant relationship between employees' AI awareness and their intention to leave their jobs.

No statistically significant relationship was found between the Intention to Leave Scale and the Readiness for Change Scale ($p>0.05$). Although readiness for change is a feature that facilitates adaptation to organizational innovation processes, it may not be a determining factor in individuals' decisions to leave their current jobs. This finding is consistent with some studies in the literature. For example, Neves (2009) stated that employees' readiness for change is not directly related to their intention to leave their job, but rather has an indirect effect through emotional commitment to change. Similarly, Cunningham (2006) reported that there was no statistically significant relationship between individuals' commitment to change and their intention to leave their jobs. This result shows that commitment to change does not affect employees' intention to leave their jobs in all cases.

In line with the research findings, it is recommended that institutions organize awareness and training programs for employees in order to improve attitudes towards artificial intelligence. In particular, inclusive approaches should be adopted to support female employees in developing positive attitudes towards technology. The fact that young employees have higher intentions to leave their jobs reveals the importance of career planning, supportive leadership and commitment-enhancing practices specific to this group. In addition, the fact that individuals who interact more with artificial intelligence technologies have higher levels of positive attitudes and openness to change indicates that employees should be actively introduced to these technologies. Finally, considering the difference between income level and readiness for change, supportive programs should be developed to facilitate the adaptation of employees in the low-income group to change processes.

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Research Article

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The Relationship Between Cultural Products and International Marketing Strategies Towards Sustainability: A Research on the Textile Industry[1]

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Abstract

This study aims to reveal the relationship between cultural products and international marketing strategies from a sustainability perspective. In pursuit of this purpose, improving cultural products and presenting them to foreign markets is seen to contribute to the economic and environmental sustainability of societies by strengthening the cultural economy. Sustainability is not only an environmental issue but also an integrated issue that includes legal, economic, cultural, technological, etc. The sustainability of cultural products, which represent our cultural heritage, is believed to play a significant role in promoting the sustainability of societies. The weaving sector investigates strategies for cultural products to enter international markets, contributing to both the sustainability of cultural heritage and the economic development for consumers seeking unique products in a globalized context. This study, which is exploratory research, collected data through a focus group technique. The data analysis results indicate that cultural products can primarily utilize standardization strategies, followed by glocalization strategies, to enter foreign markets. In addition, cultural products, which are cultural heritage, contribute to environmental, cultural, and social sustainability.

Keywords: Culture Product, Sustainability, Loom, International Marketing.

JEL Codes: M30

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1. Introduction

Sustainability has perhaps been discussed and redefined for many years as a concept that emerged as a result of the negative effects of industrialization. Sustainability is expressed as a policy aimed at a system that creates long-term and permanent solutions to the fundamental problems related to production and consumption, rather than short-term ones. For example, building a robust corporate infrastructure that can generate a continuous flow of benefits or services in the long term is a sustainable practice. This situation shows that sustainability is a broad concept that encompasses not only the environment but also all subsystems of society. Many subsystems, such as economy, politics, law, technology, and culture, contribute to sustainability. This study examines strategies for entering international markets for the Ormana Gilamikli Loom, a cultural product from Antalya, Türkiye, framed within sustainability and regarded as cultural heritage. The Ormana Gilamikli Loom, regarded as a traditional and ecological product, will enhance sustainability in global markets while showcasing cultural uniqueness. Attaining such a position in global markets fosters development. Throsby highlights the relationship between culture, economy, and sustainability, stating that cultural sustainable development is possible (Throsby, 1995). This approach links sustainability not only to numerous subsystems but also to the cultural economy and its products. The integrated functioning of all subsystems that constitute society makes sustainability possible. Cultural products, one of the critical variables that constitute the cultural economy, are defined as products that emerge in the structure and natural environment of each society and can transform into economic value today. Especially with globalization, the increasing similarity between societies heightens the need and demand for the uniqueness of cultural products. Cultural products that emerge within the scope of the cultural industry and cultural economy enable the production of goods in many fields, from gastronomy to cultural heritage and from fashion to architecture. The demand for original works, products, and experiences from global consumers allows societies to reproduce their internally developed cultural products and present them to world markets. In this sense, the development and internationalization of cultural products are important for both the cultural economy and sustainability. For this reason, determining and implementing appropriate internationalization strategies in the context of cultural products contributes to sustainability.

2. Cultural Product Concept and Sustainability

The concepts of culture and product are approached from various perspectives across different disciplines. In the marketing discipline, these concepts are explained through the lens of developing promotions and marketing strategies for cultural products. This focus highlights the intricate relationship between culture and the products that emerge from it. The cultural product is based on the concept of cultural marketing. Cultural marketing, on the other hand, emerges with the development of the concepts of the culture industry and the cultural economy.

The concept of the culture industry was introduced by Theodor Adorno and Max Horkheimer, representatives of the Frankfurt School (Critical Theory), after World War II; it was conceptualized as a critique of the industrialization of culture. According to Adorno, "the culture industry is a concept that combines the old with the familiar in a new quality." (Adorno, 2003:36). The culture industry emerges as a system that homogenizes societies, eliminating difference, originality, and uniqueness, it is criticized in this regard. At the same time, the concept of the culture industry, which is criticized for being profit-driven and creating economic value, is argued to be devoid of authenticity because the true value of art and culture cannot be realized and is directed solely by profit-oriented policies and strategies (Adorno, 2011: 47–50).

Although the concept of the culture industry was introduced as a critique by Adorno and his colleagues after World War II, it is now observed that certain characteristics present in societies' cultures have become an industry, leading to the creation of a culture economy. According to Amin et al. (2007), culture and economy are two inseparable concepts. Moral values, knowledge, trust, and the power of cultural metaphors allow culture to create different paths for the formation of the economic structure. Cultural economy refers to various approaches aimed at analyzing economic and organizational life that exhibit a common focus on the heterogeneous ways in which objects and individuals (firms, markets, consumers) are 'constructed' or 'brought together' by discourses and arrangements (Cochoy 2003; du Gay 2004; cited in Pryke, M., & Du Gay, P., 2007: 340). Cultural economy encompasses many fields, from finance to cities and from music to fashion. The cultural economy is an important field of application in terms of both environmental and competitive sustainability.

Cultural economy forms a leading trajectory of urban development and has emerged as a fundamental aspect of globalizing cities. Among the cultural industries are new media, digital arts, music and film, design industries and professions, as well as related consumption and exhibitions in the city. The cultural economy now represents the third-largest sector in many metropolitan cities in the West, including London, Berlin, New York, San Francisco, and Melbourne, and is increasingly influential in the development of East Asian cities (Tokyo, Shanghai, Hong Kong, and Singapore) as well as the megacities of the Glo-

bal South (e.g., Mumbai, Cape Town, and São Paulo) (Hutton, 2016: 2-3).

Using cultural characteristics to add extra value to a product not only benefits economic growth but can also promote unique local culture in the global market (Lin et al., 2007: 4). Especially in the face of industrialization's negative environmental impacts, the creation of cultural economies contributes to both environmental and competitive sustainability.

In today's world, simply selling a product or positioning oneself around a product is not a correct strategy. Selling an experience is becoming more important. For example, Harley-Davidson sells more than just a motorcycle. Harley-Davidson offers its customers a brand experience and a lifestyle. Therefore, when viewed at the product level, Harley-Davidson motorcycles contain meanings beyond just being a product (Kotler, 2005: 32).

Cultural products contain creative or artistic elements. Cultural products can consist of tangible items such as artistic works, books, jewelry, and fashion, as well as intangible items such as music performances and museum visits. (Towse, 2003: 12). The identification of cultural products necessitates the establishment of cultural levels.

Evaluating from the perspective of cultural marketing necessitates defining a product that encompasses more than just cultural tourism, cultural heritage, books, magazines, films, theater plays, and festivals. Identifying the true motivations behind consumers' purchases of these products is essential, as it connects them to the core product. In this context, the product levels are considered as follows.

Upon examining product levels, it is noted that the core benefit, which represents the fundamental value provided to the consumer, signifies the essential advantage anticipated from the product. Identifying the fundamental advantage of each product is crucial in developing the overall product concept. The core product encompasses all components contained within the product. The product's shape, color, and functions represent its tangible manifestations. The anticipated product level represents the degree of the product's appeal and quality. It can be characterized as all that the target audience anticipates from the product. The extended product level is established by incorporating more features and benefits into the existing product. The prospective product level is characterized as the stage at which current products may be augmented or modified in the future (Kotler & Keller, 2009). Cultural products must ascertain product levels and formulate strategies accordingly when entering international markets. According to Kotler & Keller (2009), there are five product levels.

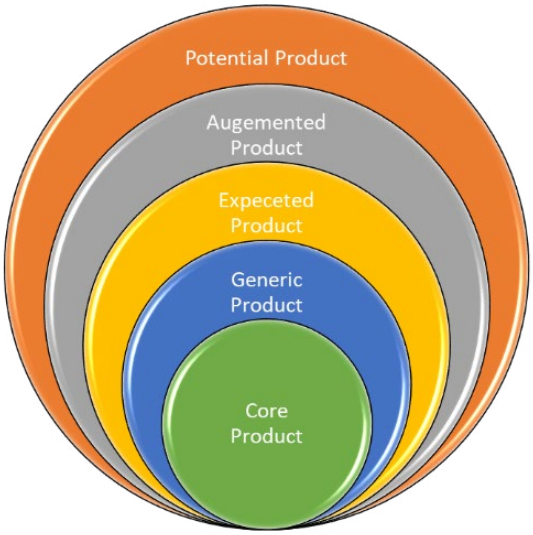

Figure 1. Product Level
Source: Kotler & Keller, 2009: 358

According to Figure 1 the core benefit describes the core benefit that the product will provide to the consumer. For example, a person who buys a dress made of woven fabric that falls within the scope of cultural heritage is only buying a dress. Essentially, the consumer will be purchasing various benefits, including culture, well-being, and a historical experience. The generic product is everything that the product contains. Everything that is tangible, such as visible, shape, size, etc. The expected product refers to what the target audience anticipates from the product. For example, there may be expectations such as a special fabric, durability, uniqueness, and being healthy. The augmented product is the features such as insurance, gaudy, etc. that can be purchased with the product. The potential product is the level of product planned to be made in the future. For example, this could involve producing home textiles in the future using the woven fabric that is currently presented as a cultural product

(Kotler & Keller, 2009: 358). Product levels should be determined when determining the strategies of cultural products. This is a factor that increases product performance.

The initial introduction of the concept of sustainability was defined as achieving equilibrium with the environment and nature in relation to production and consumption. Today, the concept of sustainability is perceived as the equitable and just distribution of limited resources to provide continuation for the global population. Sustainability is characterized as a political, ethical, and legal need for intergenerational and global equity, extending beyond merely the necessity for sustainable production and consumption methods. This indicates that sustainability is not only an environmental concern but also a subject of societal discourse across multiple dimensions. Sustainability encompasses various social domains, including ecological, political, economic, and cultural aspects. In evaluating sustainability solutions, solely relying on technological methods like consistency and efficiency is inadequate. In contexts such as energy-climate, resource use, and carbon footprint reduction, the interplay between consistency, efficiency, and frugality is crucial (Ekardt, 2024). A study on sustainability revealed that a holistic strategy is essential to reconcile economic progress with environmental sustainability in developing nations. Businesses engaging in direct investment in developing nations ought to implement green policies and strategies that enhance sustainability and economic development in such regions (Hunjra et al., 2024). The development and implementation of green marketing strategies by businesses are related to their social responsibilities and business ethics. Businesses have moral and economic obligations to their partners (Uydaci, 2019). A study in the tourist sector concludes that advancements in culture and tourism favorably influence sustainability (Tabak et al., 2025).

The accessibility of cultural products from their countries of origin to many nations and their exhibition in global markets is significant for both national culture and globalization. Numerous studies indicate that the cultural economy positively influences sustainability, which is not solely an environmental or technological concern but an interdisciplinary issue encompassing society and involving fields such as economics, law, ethics, and culture. With globalization, the curiosity and desire of various societies for unique products have intensified, rendering the internationalization of cultural products significantly vital. This setting elucidates the internationalization tactics applicable to cultural items.

3. The Relationship Between Internationalization Strategies and Cultural Products

Businesses can be categorized in various manners according to their views on internationalization, but fundamentally, three distinct strategies can be identified. In the context of entering new markets, standardization, adaptation, and glocalization are recognized as essential methods; nevertheless, recent developments have offered additional techniques and models.

Kotler elucidates that adopting identical techniques to competitors signifies a lack of strategic differentiation. A poor strategy is one that is novel but replicated. A strong and solid strategy is one that is both distinctive and hard to replicate (Kotler, 2005: 12; Arslandere & Konokman, 2023: 205). Kotler posits that the essence of robust methods resides in their distinctiveness and inability to be replicated. Nevertheless, an analysis of the correlation between marketing activities and export performance across multiple studies typically indicates that successful export performance is intricately linked to effective marketing strategies and practices. Market research, product adaptation, price, promotion, and distribution are pivotal components of the marketing mix that significantly influence the competitiveness and success of exporting enterprises in global markets (Yazıcı Sel et al., 2024: 100).

In this context, many companies utilize the three fundamental tactics described below when entering international markets. The following strategies are enumerated.

Figure 2. International Marketing Strategies
Source: Aslandere, 2023: 205

The standardization strategy that has emerged under the influence of globalization is based on the interconnection of the sub-strategies and policies developed and the support of the established standard practices for each other. Strategies aim to maximize profits and continue to compete effectively within a standard. Businesses enter new markets by making fundamental positioning decisions for leadership access (Grindley, 1995: 1277). The concept of standardization was first articulated by Buzzell in 1968 as the uniformity of all elements of the marketing mix, but it has faced criticism due to the impossibility of this situation in the future (Buzzell, 1968: 102-103). According to Medina and Duffy (1998), standardization and globalization can be at opposite ends of an evolutionary brand strategy process, while adaptation and customization are considered intermediate stages (Medina & Duffy, 1998: 224). According to Jain (1989), there are two aspects of standardization in internationalization: process and program standardization. The opposite of standardization, adaptation, is defined as the market entry of a product with a strategy compatible with that country. Research on marketing strategies centered around adaptation strategies indicates that, although the adaptation strategy enhances export performance, it diminishes the promotional and presentation efficacy of the marketing strategy. These data suggest that strategy adaptation is effective for certain elements of a firm's marketing strategy but not universally applicable. When all these facts are collectively assessed, it becomes challenging to arrive at a conclusive determination regarding strategy adaptation and corporate success (Cavusgil & Zou, 1994: 5).

According to Albaum & Tse (2001), the adaptation of a marketing mix component is suggested to be a deliberate process influenced by a company's past adaptation strategies. This situation is significant for the success of marketing (Albaum & Tse, 2001: 62). Nowadays, the primary goal of international marketers is to understand the mechanisms of inter-firm partnerships and to enhance their efficiency (Katsikeas et al. 2006: 868). At the center of the international marketing strategy is the effective management of B2B operations (Sharland, 2001; Katsikeas et al., 2006: 869). The proper management of international B2B operations is crucial for companies to create a value proposition that meets the needs of foreign customers, enabling them to achieve positive and sustainable performance (Skarmeas and Katsikeas, 2001: 228).

The issue of adapting/standardizing marketing strategies for foreign markets emerged in the international business literature in the 1960s. Initially, proponents of standardization argued that a strategy based on fundamental human nature appeals (for example, nurturing mother-child relationships; the desire for a better life, beauty, health, and freedom) could be as effective worldwide as it was in various regions of the United States. Later research showed that to discover the appropriate balance between adaptation and standardization, fundamental market and economic data (e.g., degree of competition, consumers' education level, standard of living, and economic development) should be taken into account. After extensive research conducted in the following decades (Sorenson and Wiechmann, 1975; Levitt, 1983; Ozsomer et al., 1991), it is now accepted that several internal and external forces influence the degree of standardization/adaptation (for a comprehensive review of the literature, see Theodosiou and Leonidou, 2003). Therefore, there is no single correct strategy, but each strategy can be the most suitable under specific internal and external forces (Katsikeas et al., 2006; Lages et al., 2008).

Another internationalization strategy that lies between standardization and adaptation strategies, encompassing both global and adaptation strategies, is the glocalization strategy. The glocalization strategy can be described as global brands behaving locally within global strategies. In 1983, T. Levitt demonstrated the rise of a new global market based on uniform, standardized products and services in his research titled "The Globalization of Markets," published in the Harvard Business Review. He noted that multinational companies stopped focusing on offering a wide range of diverse, customized products and services and instead began emphasizing the provision of globally standardized, reliable products and services that are recognizable, have a fair quality-price ratio, and are perceived as trustworthy by consumers because they provide the same quality of standard services and branded products at any distribution point of the relevant company (the strategy of such companies was simple: sell the same things in the same way everywhere). Recognizable products meant that consumers would more readily identify a specific brand, which would lead to increased brand awareness. Additionally, customers' overall judgment of the perceived quality of products and services would be positive, and they would associate these products with the brand, thereby creating a database of loyal customers. The aforementioned elements (brand awareness, perceived quality, brand association, and brand loyalty), as defined by Aaker, are the main dimensions of brand equity that are strongly interconnected and collectively have a significant, positive impact on brand value. However, in today's world, pure standardization or pure adaptation strategies are no longer sufficient; a glocalization strategy that meets both and emphasizes originality is being implemented (Grigorescu & Zaif, 2017). Sugiura (1990) focuses on how a global strategy can be localized.

In addition to the internationalization strategies explained above, another topic found in the literature is internationalization models. Each business may vary according to its structure and perspective on

internationalization. The different internationalization models include the U model, the I model, Global Natural Enterprises, the product life cycle model, the non-sequential model, the pre-export model, and the integrated model (Roque et al., 2019).

Internationalization strategies and models vary by sector and business, but in this study, the international expansion of cultural products will be examined. In this sense, the value of cultural products in their country of origin and their globalization efforts by entering world markets are quite valuable for many products and brands. Italian espresso, French wines and perfumes, denim fabric originating in the USA, and many other products are considered a result of the cultures of the countries they come from. In this regard, there are numerous products and brands originating from Türkiye that have the potential to undergo internationalization. Turkish coffee, baklava, archaeological sites, Göbekli Tepe, the Bosphorus, woven fabrics, etc., are many cultural products that should be evaluated both in terms of our country and the cultural economy they will create. With globalization, the universality of the same products and brands worldwide is leading consumers to seek unique products. From tourism to fashion, originality is sought after in various fields.

4. Research Methodology

4.1. Purpose and Scope of the Research

The purpose of this study is to analyze cultural products in terms of international marketing strategies and to investigate the international market entry strategy of the Ormana Gilamikli Loom, which is part of the textile sector's Anatolian weavings.

4.2. Method of the Research

This research is exploratory in nature. Due to the differences in each cultural product when entering foreign markets and their classification as specialized products, focus groups were used as the data collection technique in this research. The research was conducted on groups of six people selected from marketing department students. Four different focus groups consisting of six people were conducted. Three females and three males were selected in each group. Due to the research on the international market entry strategy of the cultural product, marketing students were chosen as the sample group because their insights would be guiding in terms of strategy and vision determination. This study was limited to Generation Z. By evaluating the perspectives of Generation Z on cultural products, the determination of future strategies is supported. Marketing students between the ages of 18-24 were selected for the focus group because marketing students have knowledge on topics such as new product development, marketing, and cultural marketing.

This study is conducted on Generation Z, who have marketing literature knowledge but no professional experience. Although the experiences of business professionals are important, the aim of this study is to evaluate the vision and potential of the young generation receiving marketing education. The scope of the study can be expanded by including business professionals in subsequent studies. This research could have incorporated marketing professionals or marketing scholars. This study primarily examined Generation Z's creativity and its influence on the internationalization strategies of Ormana Gilamikli Loom. It is widely recognized that education and experience augment knowledge but diminish creativity. This study aimed to investigate the creative concepts of individuals possessing solely theoretical knowledge, rather than both knowledge and experience. This research addresses a gap in the literature by examining the creative concepts of Generation Z through cultural products. A notable deficiency in the literature pertains to the notion of sustainable cultural products. A further concept arising from this study is sustainable cultural products. In this regard, it is distinctive, as it presents a novel concept and examines the notions of sustainability and cultural products. Apart from this, this study was conducted only within the scope of developing marketing strategies, internationalization, cultural products, and sustainability strategies; it is not a consumer study. Again, it may be appropriate to conduct Ormana Gilamikli Loom on consumers in the next stage of the study. However, since future strategies are not discussed here, the study was conducted only on marketing students who have marketing knowledge and have not yet graduated. The sample selection was made in accordance with the exploratory research type. According to Morgan (1997), focus group studies should consist of homogeneous groups with similar experiences and be conducted on at least 3 different groups. The 4 different groups consisting of 6 people selected in this study were selected according to the Morgan 1997 study. The focus group moderator is someone who has experience in different focus group studies in the last fifteen years and has worked in the field of marketing. The focus group team consists of a moderator and two moderator assistants. The moderator forwarded the questions to the group, and the assistants objectively noted the participants' answers. In addition, audio recordings were taken. During the transcription process, the reports of the two moderator assistants and the audio recordings were compared, and content analysis was performed accordingly. In addition, validity and reliability approval was obtained with 12 randomly selected people from 24 participants using the member assessment technique. According to the member examination results, a consensus was reached that there was no question that was understood differently or not understood.

Focus group questions were prepared based on the literature, and ethical approval was obtained from the Scientific Research and Publication Ethics Committee of the Faculty of Technology at Marmara University with decision number 20.10.2023/2023-11.

Questions were asked of the selected groups about the methods to be used in entering international markets and the marketing strategy, and data related to these topics were collected. The focus group questions are as follows:

1. In your opinion, what should be entry to international markets strategy of Ormana Gilamikli Loom? (Local, standardization or glocalization strategy?)
2. In your opinion, who is / should be the target group of Ormana Gilamikli Loom?
3. In your opinion, what concept should Ormana Gilamikli Loom be built on?
4. In your opinion, what should be product level for Ormana Gilamikli Loom?
5. In your opinion, which brand personality should Ormana Gilamikli Loom have?
6. In your opinion, what should be the positioning strategy of Ormana Gilamikli Loom?
7. In your opinion, what promotion tools should Ormana Gilamikli Loom use whe communicating with their target group?
8. In your opinion, what should be the distribution channel of Ormana Gilamikli Loom?
9. In your opinion, what should be the pricing strategy of Ormana Gilamikli Loom?
10. In your opinion, is Ormana Gilamikli Loom an environmentally friendly product?
11. In your opinion, should a cultural product be environmentally friendly? Why?
12. In your opinion, Do you think Ormana Gilamikli Loom can be positioned as a sustainable cultural product?

4.3. Analysis of Research Findings

This study analyzes the entry strategies of cultural products into international markets, and it has selected Gilamikli, Ormana Loom, which was developed in Ormana Village, İbradı District, Antalya, Türkiye as the cultural product. The name Gilamikli Ormana Weaving comes from the word "gılamık," which means cocoon silk in the Ormana region of Antalya. It is also known by the names "kılamuk," "gılamık," "gılamuk," "gılamıklı," and "kılamuklu." Gılamık weavings resemble the Muğla-Fethiye-Üzümlü weavings and the İzmir-Ödemiş-Bürnük weavings. It is known that Gilamikli Loom, which is mostly used as home textiles today, was used as a headscarf in the past. Although there is no clear information in historical sources, it indicates that the history of this fabric in the region dates back many years. Gılamık Weaving: It is woven in a plain weave structure with cotton warp and silk weft threads, approximately 40–45 cm wide. After being woven in three pieces, the fabric is sewn together and used. Depending on the fineness and twist of the threads, fine and thick fabrics are woven. Gilamik Loom used to be made with silk and cotton materials, but nowadays it is generally woven with artificial silk, linen, and cotton. In the weaving, natural white silk and cotton threads are used. The Gilamik Loom has patterns called Karadağ, Çatal Oluk, Yeni Çatal Oluk, Sınat, Eski Model, Eynif Model, Kızılağaç, and Söğüt. Gılamik Loom has been used as a headscarf, entari (outerwear), sheet, and cover. The photo of the Ormana Gilamikli Loom is below (turkiyedokumaatlasi.com):

Figure 3. Gilamikli, Ormana Loom
Source: turkiyedokumaatlasi.com

The history of Gilamikli Loom has come down to the present day as part of the rich cultural heritage of Ormana Village. Gilamikli Loom is a textile made using a warp of cotton and a weft of silk threads in a plain weave (Bayburtlu, 2023). It can be considered a cultural product evaluated under the category of intangible cultural heritage by UNESCO.

Focus group responses were analyzed using the content analysis technique. The content analysis was analyzed within the scope of the main themes of internationalization and sustainability. In the main theme of internationalization, standardization, and glocalization, polite, highly educated, middle-upper-income, healthy-living adopters; calm, gentle, wise brand personality codes emerged. In the main theme of sustainability, the codes of naturalness, product being a cultural heritage, being healthy, being respectful to the environment and people, and being sustainable were determined. Since the participants' answers were repetitive and similar, the answers of the researchers were not directly included. The research findings regarding the answers are given below.

Table1. The Analysis and Results of the Research Findings

QUESTIONS	FINDINGS
In your opinion, what should be entry to international markets strategy of Ormana Gilamikli Loom? (Local, stan-dardization or glocaliza-tion strategy?)	As the target market, it is recommended to select nearby countries primarily based on geographical and psychographic criteria. To preserve the uniqueness of the Ormana Gilamikli Loom, it is concluded that entering the market with a stand-ardization strategy is appropriate, and after the product gains a foothold in the market, a glocalization strategy can be em-ployed.
In your opinion, who is / should be the target group of Ormana Gilami-kli Loom?	The participants agreed that the niche marketing strategy was more suitable as a targeting strategy. The target group of Ormana Gilamikli Loom includes individuals who embrace a healthy lifestyle and a simple, plain, and gentle way of living. These individuals are characterized as polite, highly educated, and belonging to the upper-middle and upper-income brack-ets.
In your opinion, what concept should Ormana Gilamikli Loom be built on?	Participants stated that a concept could be built upon the Ormana Gilamikli Loom that meets the notions of calm, soft, natural, comfortable, and sophistica-ted.
In your opinion, what should be product level for Ormana Gilamikli Loom?	The Ormana Gilamikli Loom emphasizes health, tranquility, and naturalness at its core product level. At the actual product level, it features a cream-colored fabric made from a silk-cotton blend. The expected product level aims to provide a retro, comfortable, and high-quality experience for users. The enriched product level should be linked to the use of jewelry and other accessories, the establish-ment of a post-sale cus-tomer relationship management process, and the poten-tial inclusion of products such as clothing, home textiles, bedding, and curtains.
In your opinion, which brand per-sonality should Ormana Gilamikli Loom have?	The brand personality should embody qualities such as calm-ness, gentleness, serenity, sophistication, and wisdom.
In your opinion, what pro-motion tools should Ormana Gilamikli Loom use when com-municating with their target group?	For this study, the most effective method for the target audi-ence is considered to be the influencer marketing strategy. It is believed that influencers with a na-tural lifestyle and a high number of followers in the international arena, who are par-ticularly suitable for the target audience, will be effective in product promoti-on.
In your opinion, what should be the distribution channel of Ormana Gilamikli Loom?	In international markets, companies are advised to initially sell through electronic channels before entering the market through exports. These procedures can involve either direct or indirect distribution channel policies, depending on the specif-ic country of entry. The conclusion indicates that a selective distribution channel strategy should be adopted as the pre-ferred approach for distribution.
In your opinion, what should be the pricing strategy of Ormana Gilamikli Loom?	Participants recommend setting the price of the Ormana Gilamikli Loom at a mid-high or high level. However, during the market entry phase, they suggest adopting a penetration pricing strategy, which involves initially offering the pro-duct at a lower price than competitors. Once the product gains a foothold in the market, participants propose that the price can be gradually increased.

In your opinion, is Ormana Gilamikli Loom an environmentally friendly product?	The fact that the Ormana Gilamikli Loom has been established for many years and utilizes silk and cotton in its products demonstrates its commitment to environmental sustainability. It may even qualify for an organic or eco-friendly product label.
In your opinion, should a cultural product be environmentally friend-ly? Why?	Cultural products are products that contribute not only to the economy but also to society. They ensure that culture is kept alive. For this reason, cultural products should reflect the life-styles of societies as well as being environmentally friendly, which will ensure their sustainability. In fact, it would be ap-propriate to develop sustainable cultural products.
In your opinion, Do you think Or-mana Gilamikli Loom can be posi-tioned as a sustainable cultural product?	Ormana Gilamikli Loom can be positioned as a sustainable cultural product due to its existence for many years, its raw material being silk and cotton, and its disappearance in na-ture. This position will ensure that it establishes a strong bond with its target market.

According to the research findings, Ormana Gilamikli Loom, considered a cultural product, has been analyzed in terms of the internationalization of cultural products and methods for entering international markets. Ormana Gilamikli Loom should initially adopt a standardization strategy to enter foreign markets, subsequently implementing a glocalization strategy. The target audience of Ormana Gilamikli Loom consists of individuals in the upper-middle and upper-income groups with high education levels and a healthy and natural lifestyle, making the use of a niche targeting strategy appropriate. It emerges that the brand positioning and brand personality are built upon a calm, soft, natural, comfortable, and sophisticated concept. Again, when evaluated in terms of product levels, it has been concluded that the concepts of health, calmness, and naturalness are at the core product level, and there could be potential products in the home textile product category, such as curtains and bed linens. Finally, during the process of entering foreign markets, it has been determined that influencer marketing efforts can be used to promote Ormana Gilamikli Loom, and although a penetration strategy may be followed initially, a high pricing strategy could be implemented. Depending on agreements with countries, entry into foreign markets can be achieved through the export method using either a direct or indirect distribution policy.

In addition, participants think that Ormana Gilamikli Loom is a cultural product that contributes to sustainability. They recommended that this product receive an organic or ecological product label. Ormana Gilamikli Loom is described as a sustainable culture product due to its features such as being made of silk and cotton, not containing any synthetics, existing for centuries, and being destructible in nature. Highlighting its status as a sustainable cultural product could enhance brand positioning.

The focus group study conducted on Ormana Gilamikli Loom has led to the conclusion that marketing strategies will be tailored to specific countries. These strategies will utilize methods such as standardization, adaptation, and glocalization to facilitate the entry of cultural products into international markets.

5. Conclusion

Societies are experiencing a reshaping of their needs, as many concepts are being redefined in a rapidly changing world. This transformation reflects the dynamic nature of our environment and highlights the importance of adaptability. The continuation of societies' existence is made possible by both adapting to the natural environment and the integrated functioning of subsystems that constitute the society, such as economic, technological, legal, cultural, etc. This situation is achieved not only through the natural environment but also through the integration of many systems existing in the social sphere in terms of the concept of sustainability.

This research focuses on examining how cultural products in the textile sector approach internationalization strategies, particularly regarding sustainability. It seeks to understand the methods employed and their implications for sustainable practices within the industry. Cultural products are becoming increasingly important today, both for their contributions to the cultural economy and for their role in sustainability. Cultural products that support the sustainability of societies encompass both tangible and intangible cultural assets. Cultural products can be produced in sectors such as architecture, gastronomy, cultural heritage, fashion, technology, etc. It is quite important to determine which strategy and method should be used to introduce cultural products derived from the unique cultural structures of societies to international markets. Especially with the impact of globalization, the presence of similar products worldwide is directing today's consumers toward a search for unique and high-quality products. Cultural products are particularly important at this point and can be offered to all world markets. This, in turn, positively contributes to the sustainability of societies.

This study, aiming to reveal the internationalization strategies of cultural products in terms of sustainability, investigates the entry strategies and methods of Ormana Gilamikli Loom, which is in the textile sector, into international markets. It also tries to re-

veal the contribution of Ormana Gilamikli Loom to sustainability as a cultural product. Cultural products have traditionally been able to maintain their existence for centuries. In general, they are in harmony with nature and contribute to well-being. For this reason, while the entry of Ormana Gilamikli Loom into international markets is examined in terms of cultural economy, its contribution to sustainability is also revealed. In this study, the focus group method was used, and the participants' responses regarding the contribution of Ormana Gilamikli Loom to internationalization and sustainability were obtained through semi-structured interview questions. According to the research findings, it has been concluded that the Ormana Gilamikli Loom, as a cultural product, should primarily focus on standardization in international markets, and after the product has established itself in the market, a glocalization strategy can be employed. The brand positioning of Ormana Gilamikli Loom is described as soft, calm, natural, comfortable, and sophisticated. Additionally, the brand personality should reflect these qualities. This situation necessitates that Ormana Gilamikli Loom reflect this brand personality and positioning in its product design, pricing, and distribution channels as well. Since the target audience is middle-upper and upper class, even though the price should be low during the initial market entry period, it should gradually transition to a high pricing strategy once the product is established. Participants recommend entering the market with a penetration strategy. It has been concluded that the distribution channel strategy should be selective. Additionally, influencer marketing is considered one of the most effective promotional strategies.

A literature review on the Ormana Gilamikli Loom yielded few studies. Özoğul and Bulut (2021) examined the matter through the lens of tourism and cultural allure, whereas Bayburtlu (2023) assessed it from the standpoint of fashion design and sustainability. The Ormana Gilamikli Loom was associated with sustainability in relation to intangible cultural heritage, and the designs produced with it were delineated. No literature contains studies on the marketing and internationalization of Ormana Gilamikli Loom. A study by Öztek and Yerden (2021) proposed a branding model for Sile Gauze. The study did not integrate sustainability with cultural products. Additionally, an examination of the global literature uncovered multiple studies concerning Belgian linen. These studies primarily concentrated on the historical evolution of Belgian linen and its production methodologies. Turner (1946) analyzed Belgian linen concerning the linen industry and exports but neglected to consider brand positioning, sustainability, or cultural products. Moreover, denim is the most extensively researched fabric in the literature. Denim, especially in the context of jean manufacturing, is frequently analyzed regarding recycling, eco-friendly production, and sustainability (Li et al., 2025, 14; Rahaman et al., 2025: 6111). An examination of national and international literature uncovers research on diverse textiles. These studies primarily concentrate on fashion design, production methodologies, exportation, and sustainability. This study enhances the literature by integrating cultural products with sustainability and analyzing strategies for entering international markets.

Upon examining the sustainability of the Ormana Gilamikli Loom, it becomes evident that it has persisted for a duration of 200 to 300 years. This longevity should be strategically utilized in brand positioning efforts. Furthermore, the loom is regarded as a sustainable cultural product due to its natural weaving structure, which does not inflict harm on the environment. There is potential for the Ormana Gilamikli Loom to attain an organic or ecological product label in the future, thereby enhancing its uniqueness in international markets. Products with such historical endurance serve not only as cultural artifacts but also as significant contributors to environmental sustainability.

The research is limited to Generation Z and marketing students. The research is limited because it is an exploratory research and the expectation is that Generation Z will guide future strategies. In addition, the research was conducted within the scope of work culture products and sustainability.

In conclusion, this study examined the international market entry strategies of the cultural product, specifically focusing on Ormana Gilamikli Loom. At the same time, the contribution of cultural products to sustainability is evaluated. This study, conducted specifically for Ormana Gilamikli Loom, reveals a marketing strategy for the product's entry into international markets and concludes that the product contributes to sustainability. The product can be positioned as a sustainable cultural product, particularly because its structure promotes healthy living. When entering international markets, it would be advisable to initially implement standardization strategies, followed by glocalization strategies.

One of the most important results of this study is that cultural products will contribute more to the general structure of the economy when they are associated with sustainability, in addition to developing cultural economies with internationalization strategies. It is predicted that cultural products that contribute to the United Nations Development Goals in world markets will be preferred more by their target audiences.

This research is based on a focus group study conducted only on marketing students. In future research, it is recommended to renew the focus group study with a wider audience, including sector professionals and academics, and compare the results. At the same time, conducting the research on interna-

tional consumers based on quantitative techniques will contribute to the development of the concept of "sustainable cultural product" and the determination of internationalization strategies. In addition, it is recommended that the research be conducted on different cultural products evaluated within the scope of cultural products.

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Research Article

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Effects of Economic Activities on Stock Market Prices: Case of Borsa Istanbul Sustainability Index[1]

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Abstract

For over a century, the rapidly increasing trend of industrialization has led to the excessive use of natural resources. In the field of economics, many studies are being conducted to ensure the sustainability of growth and development for this reason. In the capital markets, various indexes have been created that are based on companies meeting certain criteria and demonstrate their commitment to sustainability. Being included in these indexes provides firms with both prestige and the opportunity to use alternative green financial instruments. Certainly, stock markets are influenced by macroeconomic and political developments. The explanatory power of economic variables in determining stock market price movements has been extensively investigated and generally substantiated in many empirical works. This study examines the impact of nominal and real economic variables' (inflation and industrial production index, respectively) convergence inside the Borsa Istanbul Sustainability Index for the period January 2015-April 2025 with Fourier-based methodologies due to the structural changes in the Turkish economy. The cointegration test result indicates that the null hypothesis of cointegration is not rejected. So, it confirms that there is a long-term positive and significance relationship between the BIST Sustainability Index, the industrial production index, and inflation rates. These results are important for risk diversification among investors who are considering sustainability sensitivities.

Keywords: Borsa Istanbul Sustainability Index, Inflation, Industrial Production Index, Fourier Cointegration.

JEL Codes: E44, G12, O16

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1. Introduction

For quite some time, sustainable development has come to the mostly important topic of both international and local policy agendas. The term of "Sustainable Development", is basically refers to development that satisfies the demands of us without jeopardizing the ability of next generations to fulfill their own demands (Goldin and Winters, 1995:1). These demands are differing around the world as about the air and water pollution, climate, poverty, energy, or urbanization.

There are several debates about the natural scarcity and the pollution effects of industrialization and population growth. The "Our Common World", published by the United Nations World Commission on Environment and Development, is commonly accepted as the start of a sustainable economy (Mebratu, 1998: 496). According to the report, the idea of sustainable development does entail constraints on natural resources imposed by current social structures and technological advancements, as well as the biosphere's capacity to absorb the consequences of human activity. Sustainable development can only be achieved if population size and growth match the ecosystem's changing productive capacity. Rapidly rising populations can strain resources and slow living standards. Therefore, sustainable development is not a situation but a process (WCED, 1987: 16).

The business world started to give excessive emphasis to environmental problems after Stockholm Conferences in the 1970s. The emphasis began with pollution prevention but has since evolved to include organizing self-regulation processes and integrating sustainability into business practices. Agenda 21, which was prepared at the Rio Summit held by the United Nations in 1992, is an important starting point for collaboration between ecologists/environmental groups and the business world. With the post-Rio period, the internalized environmental discussion has come to be a central part of corporate governance (Redclift, 2005: 216).

As interest in the concept of sustainability grows, numerous related terms have emerged in the literature. The increased focus on sustainability is not solely due to the environmental agendas of the government; companies, consumers, and investors are also placing greater importance on the subject. One of the key concepts related to sustainable development is corporate social responsibility. Companies are not solely focused on maximizing profit and outcome; besides these, they are also giving importance to environmental and social issues, too. The supporters of sustainability idea criticize the profit-origin actions that are widely accepted in neoclassical firm theory. According to them, companies must address both environmental and social responsibility burdens in addition to their economic priorities (Ebner and Baumgartner, 2006:3). The term corporate social responsibility is used interchangeably with Economic, Social, and Governance (ESG). This term is considerations into corporate management and investor's portfolio decisions.

Here, the World Bank describes the term "sustainable finance" with ESG issues. According to the bank, sustainable finance is "the process of taking due account of ESG considerations when making investment decisions in the financial sector, leading to increased longer-term investments into sustainable economic activities and projects" (World Bank, 2021). The World Federation of Exchanges declared five principles for sustainable finance. Principle #4 expects exchanges to improve products and markets to support the scaling-up of sustainable finance (WFE, 2018). This means that sustainable themed indexes are supported by international organizations.

Sustainability information offers insights into corporate management quality. Furthermore, it helps investors in predicting firm performance by presenting a broader viewpoint of the organization. For several investors, the proficient evaluation of sustainability considerations has become an essential component in determining the value of their investment. Consequently, investors are increasingly demanding corporations disclose their management of sustainability-related risks and opportunities and the sustainable effect of their activities on the real economy (SSE, 2024: 2).

The transparency shown by publicly traded companies in their sustainability efforts has become an important indicator of prestige alongside their current financial indicators. Therefore, being included in sustainability-themed indexes has become important for companies. However, a company's inclusion in a specific index is not the only important factor determining its pricing on the stock exchange markets. In addition to the company's internal dynamics, macroeconomic developments also have significant impacts on the market values of companies. Within financial theory, the impact of various macroeconomic data on firm values or, more generally, on stock market indexes has been a subject of discussion for a long time.

The early example of a sustainability index is the Domini 400, which was launched in 1990 for US mid and small-cap companies. After that, there were several sustainability-themed indexes created by developed markets. But for emerging markets, creating products and indexes is relatively new. Especially after the 2008 financial crisis, emerging markets have started to develop products focused on sustainability (IFC, 2011:15).

Borsa Istanbul published a sustainability guide for companies and launched the Sustainability Index in 2014, in line with the sustainability principles of the World Federation of Exchanges mentioned above. As of April 2025, there are 88 companies listed in the index with 190 billion USD market value, approximately. Figure 1 shows the sectoral breakdown of Borsa Istanbul Sustainability Index.

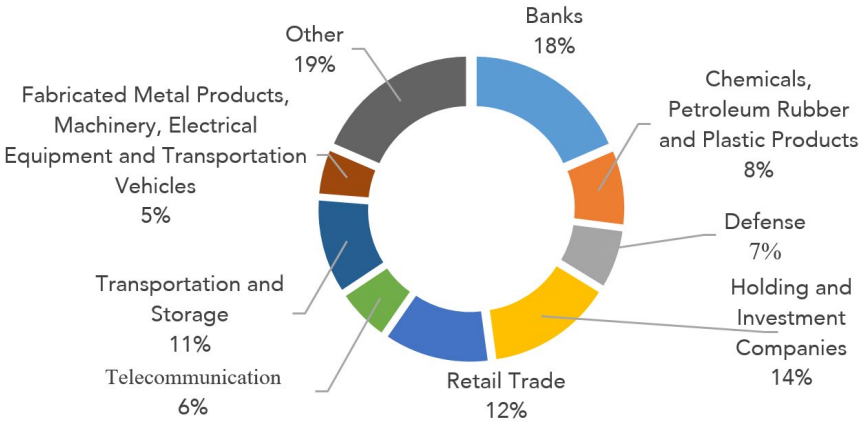

Figure 1. Sectoral Distribution of BIST Sustainability Index

Source: https://www.borsaistanbul.com/en/index-detail/324/bist-sustainability, 31.05.2025

For the scope of this investigation is examining the economic convergences (both of nominal and real variables) among Borsa Istanbul Sustainability Index with monthly data from January 2015 until April 2025. Also, this study aims to investigate the explanatory power of these two groups of variables on stock market's sustainable-themed index value. These variables are the consumer price index, which represents the nominal economic variable, and the industrial production index, which represents the real economic variable. Because GDP data are available on a quarterly basis, their combination causes mismatched data problems related to inflation and exchange rates, as well as missing data points. So, the industrial production index is used instead of GDP.

Despite the presence of individual or corporate investors using sustainable investing strategies for ESG considerations, it remains uncertain if macroeconomic indexes influence the sustainability-sensitive stock market companies. There is no clear resolution to the issue. This research aims to examine the relationship between selected macroeconomic factors and Türkiye's sustainable stock market index. Although several empirical analyses examine the effects of key economic variables on exchanges, there is a lack of studies on the BIST-Sustainability Index, which is considered a sub-index, that utilize Fourier-based structural break analysis. This type of analysis provides insights to individual or corporate investors concerned with sustainability regarding the relationship between macroeconomic variables and price movements in the sustainability index.

The findings of the study indicate that real economic conditions and price stability, which refers to the nominal economic situation, are likely to affect positively the exchange market's value. This result is understandable because of the BIST Sustainability Index's sectoral breakdown. Approximately one-third of the index consists of banks and retail trade companies. These sectors actively participate in monetary policy actions, which naturally lead to inflation. Besides this, the production index is also important for real economic sectors. Therefore, changes in policy or trends in the domestic and external economic situation are significant for stock market values.

The remainder of this paper is separated into five sections. Section I reviewed the literature, Section II describes data and methodology, Section III summarizes findings. Finally, Section IV and V presents a discussion and conclusion.

2. Literature Review

How macroeconomic factors affect stock markets is an important issue for not only policymakers and market practitioners but also a favourable research question among scholars. There are several studies about the relationship between macroeconomic variables and various stock market indexes. These analyses have shown different results according to the analysis period, countries or indexes covered, and variables that were used. This section gives a short summary about the relationship between economic variables and stock market indexes.

The pioneer studies about the linkage between macroeconomic variables and stock markets generally found a significant relationship. Fama (1981) explained the anomalous stock market return and inflation relationship for the post 1953 period and stated significance positively linkage for US Stock markets. Chen et al. (1986) tested the economic state variables' influence on asset pricing for US stock market for 1953-1983 period. They found a significant relation between stock returns and industrial production, the risk premium on corporate over government bonds, and inflation rates.

Humpe and Macmillan (2009), tested the cointegration between macroeconomic variables and stock market for US and Japan stock markets. They found that stock prices are positively related with industrial production and negatively related with consumer price index and long-term interest rates for US. But for Japanese, stock prices are influenced positively by industrial production only.

Subeniotis et al. (2011) investigated the relationship between stock market indexes and crucial macroeconomic variables with panel data analysis for EU-12 countries. Their results showed that a strong effect of market capitalization, industrial production and the economic sentiment indicator, while inflation was not statistically significant.

Ozcan (2012) analyzed the relationship between the BIST Industry Index (formerly ISE) and a set of macroeconomic variables for the period 2003–2010 monthly. The result of the cointegration test indicates a significant relationship between variables and moving together in the long run.

Bari and Adalı (2020) tested the relation between industrial production index, the consumer price index, the oil prices, foreign reserve in the Central Banks, the interest rates, the money supply, the exchange rates and BIST-100 index using Fourier cointegration test. Test results verify that absence of the long-run cointegration between BIST-CPI, BIST-Reserve, BIST-Oil, and BIST-Interest, respectively, is confirmed. On the other side, the long-run tie between BIST-Exchange and BIST-Money exists.

Studies on the Sustainability Indexes could distinguish two main groups. One group is focused on examining the relative performance of sustainability indexes with the benchmark indexes or others. Also, there are event studies about the firms that are listed or delisted in sustainability indexes. Lopez et al. (2007) examine the relationship between business performance and Corporate Social Responsibility with the selected group of Dow Jones Sustainability Index companies and Dow Jones Global Index for 1998-2004. Their results showed that differences in performance exist between firms that belong to the two indexes and that these differences are related to CSR practices. Oberndorfer et al. (2013) analyzed the effect of the inclusion of German corporations in the Dow Jones STOXX Sustainability Index and the Dow Jones Sustainability World Index on stock performance. Their results indicated that a German firm's inclusion in the indexes is a handicap for its market performance. Hawn et al. (2018) examine investor reactions to events of firms that are listed or delisted from Dow Jones Sustainability Index and showed that investors care little about the announcements. Karakaya and Kutlu (2022) tested the effect of volatility spillover between sustainability indexes, using E-GARCH models for the period of 2015-2019. Their results showed that the impact of negative news has been more effective than positive news in the Borsa Istanbul, Dow Jones World and Dow Jones European sustainability indexes.

The second group of studies is focusing on the macroeconomic variables' effects on the sustainability indexes. But this kind of research question is rare. Drimbetas et al. (2010) analyzed the impact of macroeconomic variables on the Dow Jones Sustainability Index, using a GARCH model for the period of 1999-2008. Their findings show that crude oil returns have a negative effect, while the 10-year bond value has a positive effect. Kaur and Chaudhary (2021) investigated the relationship between Indian stock market index and macroeconomic variables for 2013-2020. Their findings shows that there is a long-term cointegration between variables and market prices. Özçim (2022) analyzed the effect of the macroeconomic variables (Brent oil, the ratio of deposits opened in TL to total deposits and exchange rate) on the volatility of the BIST Sustainability Index for the period of 2014-2021 on weekly basis. result of the study showed that the Brent oil variable did not affect the BIST Sustainability Index volatility, the exchange rate variable increased the volatility of the index and the interest rate variable decreased the volatility.

3. Data and Methodology

Inspired by the methodology of Chen et al. (1986), Phengpis et al. (2004) and Humpe and Macmillan (2009), a similar approach to investigate the relationship between stock market price, industrial production index and inflation. But some modifications made to enhance to applicability of their model for Turkish stock market, as Chen et al. (1986) indicated. Due to the newly developed instruments related to green finance, this study did not consider the spread between high-grade and low-grade bonds. Besides this, the alteration and unpredictability of Turkish monetary policies in the analysis period (sharp changes between positive and negative real interest rates, credit tightening, or expansions) could inhibit the explanatory power of the model. So, interest rates were excluded from the model, too. The study uses a function to examine the relationship between economic factors and BIST Sustainable Index as are follows:

$$lxusrd = \alpha_0 + \alpha_1 linf + \alpha_2 lind + \varepsilon_t \qquad (1)$$

where ε_t t is the error term xusrd is corresponding Borsa Istanbul Sustainability Index; inf is the consumer price index and, ind is the industrial production index. All variables included to equation in their natural logarithm forms. α_i's are coefficient in model to capture the long run effects of explanatory variables. Inflation and industrial production indexes are calculated by Turkish Statistical Institution (TURKSTAT). Sustainability index data are obtained by Matriks Data Platform, one of the accredited data distribution firms of Borsa Istanbul. The monthly time series are used from the period January 2015 and March

2025. BIST Sustainability Index has been calculating since November 2014; but to interpret the date range of the analysis more clearly, it has been preferred to use data from the beginning of the new year. This period includes several shocks and volatilities, such as market crashes (in summer 2018, December 2021, and March 2025), a bull market (the 2021-2022 period), a global pandemic shock that has affected both the real economy and stock markets, several monetary policy regime changes, and local or international geographical / geopolitical shocks (earthquake in 2023, Russia-Ukraine war). Therefore, the number and forms of breaks in the variables cannot be determined clearly. That is why Fourier-based tests are referenced in this study. Appendix 1 shows the Inflation, Industrial Production Index and BIST Sustainability Index historical values in the logarithmic form and their Fourier approximations. According to Equation (1), following hypothesis is proposed:

H0: Inflation and Industrial Production Index are not associated with BIST Sustainability Index.

H1: Inflation and Industrial Production Index are associated with BIST Sustainability Index.

Equation (1) is based on the valuation model that a stock market's value (in terms of xusrd index) is the present value of expected future dividends which could be explained by nominal and real economic fundamentals. One of the earliest papers about the connections between inflation and stock markets, Bodie (1976) investigated the effectiveness of common stocks as an inflation hedge. For the period 1953-1972, the results indicated that the real return on equity is negatively related to both anticipated and unanticipated inflation. According to Feldstein (1983), higher rate of inflation at the t0 time, correlates with an accelerated increase in share prices. Boyd, et al (2001), indicates that higher rates of inflation relate to higher inflation and stock return variability. On the other side, Bekaert and Engstrom (2010) found that in recessions economic uncertainty and risk aversion may increase leading to higher equity risk premiums, which, in turn, increase yields on stocks for US markets. Tiryaki et al. (2018) examined the asymmetric effects of industrial production and some other macroeconomic variables on the BIST100 with NARDL model for the period 1994-2017. Their findings showed that the effects of the changes in industrial production on stock returns are asymmetric, and the increase in industrial production index in Turkey causes BIST100 stock returns to increase.

Descriptive statistics of all variables are reported in Table 1.

Table 1. Descriptive Statistics

	XUSRD	INF	IND
Mean	7.6918	6.3673	4.4971
Median	7.2270	6.1048	4.4575
Maximum	9.5948	7.9911	4.7226
Minimum	6.8011	5.5233	4.0702
Std. Dev.	0.9101	0.7495	0.1457
Skewness	1.0390	0.8129	-0.1645
Kurtosis	2.5116	2.3281	1.9958
Jarque-Bera	23.3505	15.8614	5.7232
Probability	0.0000	0.0004	0.0572**
Observations	123	123	123

** denotes 5% significance level.

In econometric time series analyses, it is of great importance that the series used for determining the relationship between variables is stationary. If the series used in the analysis are not stationary, it is not possible to use standard OLS test techniques. In this scenario, cointegration analyses are preferred. Therefore, in time series analysis, it is important to first test the stationarity of the series using a technique appropriate to their nature. The intense impact of economic and political developments often prevents the data used in economic analyses from being linear. Therefore, the econometric literature has frequently developed and used tests that take both sharp and smooth structural breaks into account (Akyuz and Karul, 2023).

Becker et al. (2006) published a paper that discusses the importance of considering the nature of structural breaks in unit root or stationary tests. There

are several papers allow the structural breaks with pre-defined number of breaks or allow a single break smooth transition deterministic component before them. They indicate that economic variables can show a broad variety of breaks of unspecified number, duration or form, and that could be the cause of some important problems of interpretation. For finding a solution to unknown number and form of breaks, they develop a stationary test that uses a selected frequency component of a Fourier function to approximate the deterministic component of the model. As their testing procedure relies on the Kwiatkowski et al. (1992) this test is also called Fourier KPSS stationary test. (Becker et al. 2006: 381-382). In the period of study, Turkish economy has affected by several interior or exterior economy policy shocks. These shocks implied their effects on both real economic sectors and capital markets. Thus, in this study, a Fourier based stationary test was preferred. The data generating process is defined below:

$$Y_t = Z_t'\gamma + r_t + \varepsilon_t \qquad r_t = r_{t-1} + u_t$$

$$Z_t = \left\{1, sin\left(\frac{2\pi kt}{T}\right), cos\left(\frac{2\pi kt}{T}\right)\right\} \qquad (2)$$

where ε_t are stationary errors, u_t are iid with variance σ_u^2 $Z_t=\{1\}$ is level stationary process otherwise trend-stationary process (with cos and sin functions). k is the frequency of Fourier functions, and T is the sample size. Under the null hypothesis the process described in Eq (2) is stationary (Becker et al., 2006: 382-383).

For investigating to a long-run relationship between inflation, industrial production, and stock market indexes, a cointegration test used, which was developed by Tsong et al. (2016). This test also uses the Fourier components to consider the unknown number and forms of structural breaks, as well as Becker et al. (2006). They suggest that Fourier series could more effectively model unknown functions or non-periodic behaviors. Besides this, stationary tests are quite robust to structural breaks in economic data series, even breaks of opposite signs (Tsong et al. 2016: 1086-1087). The data generating process is defined below:

$$y_t = \alpha_0 + \sum_{k=1}^{n}\alpha_k \sin\left(\frac{2k\pi t}{T}\right) + \sum_{k=1}^{n}\beta_k \cos\left(\frac{2k\pi t}{T}\right) + \beta' x_t + \eta_t \qquad , t = 1, \ldots, T \qquad (3)$$

where $\eta_t=\gamma_t-1+u_t+v_{1t}$ with $\gamma_0=0$ and $x_t=x_{\{t-1\}}+v_{2t}$. In Eq(3), u_t is an iid process with zero mean and its variance σ_u^2 is ,γ_t is a random walk with mean zero, k is Fourier frequency. If $\sigma_u^2=0$ and $\eta_t=v_{1t}$ is a stationary process, implying that dependent and independent variables are cointegrated. Therefore, null hypothesis of test is cointegration, against to the non-cointegration situation (Tsong et al. 2016: 1087-1088).

4. Findings

In the theory of time series testing the cointegration relation between explanatory and dependent variables, examining the stationary properties is an important starting point. For this purpose, the Fourier-based KPSS test, which was improved by Becker et al. (2006), was applied. Table 2 shows the stationary test results.

Table 2. Results from Stationary Test

Constant Model				
	Level		First Difference	
Variables	**Statistics**	**k**	**Statistics**	**k**
Lnind	2.411***	1	0.014	2
Lninf	3.619***	1	0.278***	1
Lnxusrd	3.509***	1	0.055	1
Constant and Trend Model				
	Level		First Difference	
Variables	**Statistics**	**k**	**Statistics**	**k**
Lind	0.211***	2	0.01	2
Linf	0.411***	1	0.139**	2
Lxusrd	0.298***	1	0.036	2

Notes: *** indicates 1% and ** indicates 5% of statistical significance. "k" represent Fourier frequency. The maximum number of k is set to 3 and it is selected by the minimization of sum of squared residuals as in Becker, et al (2006). The statistics are based on the Quadratic Spectral rule. The critical values for Constant model are 0.132 (10%), 0.172 (%5), and 0.270 (%1) for k=1; 0.315 (10%), 0.415 (%5), and 0.667 (%1) for k=2. The critical values for Constant and Trend model are 0.103 (10%), 0.132 (%5), and 0.202 (%1) for k=2 (Becker, et al, 2006: 389)

As shown in the graphs in the appendix, all series exhibit clear trends. Therefore, on the stationary test, only the constant and trend model's results are commented on. According to the test results, all series reject the null hypothesis at a 1% significance level. This shows that all series have unit root at their level. But after taking the first differences, lind and lxusrd are stationary, but linf is stationary at 1% significance level.

To examine the long-run cointegration relationship, the Fourier-based cointegration test, which was improved by Tsong et al. (2006), was used. Panel A of Table 3 shows the results of the cointegration test.

Table 3. Results from Cointegration Test

Panel A: Test Results		
	Level Shift	**Trend Shift**
CI_k	0.048	0.087
K	1	3
F-Statistic	95.263***	15.401***
p-Value	0	0

Panel A: Test Results				
	Level Shift		**Trend Shift**	
	Coefficient	p-Value	**Coefficient**	**p-Value**
Lnind	0.402	0.709	3.382	0.001
Lninf	1.100	0.000	1.530	0.000
constant	-1.307	0.744	-15.925	0.000

Notes: *** indicates statistical significance level at 1%. "k" denotes Fourier frequency. The critical values for level shift model are 0.155 (10%), 0.092 (5%), and 0.070 (1%). The ciritical values for trend shift model 0.143 (10%), 0.094 (5%), and 0.075 (1%). The maximum number of k is set to 3 and is selected by the minimization of sum of squared residuals as in Tsong, et al (2016). The statistics are based on quadratic spectral rule. F statistics are figured to check Fourier components' significance. For extensive discussion, please see Tsong, et al (2016, p.1092).

The cointegration test results indicate that the null hypothesis is not rejected. So, the model (Eq. 1) confirms that there is a long-term relationship between the BIST Sustainability Index, the industrial production index, and inflation rates.

Lastly, to determine the long-run relationship, the dynamic OLS (DOLS) estimator was used. Panel B of Table 3 summarized the results of the DOLS estimators. The estimated coefficients (for linf and lind) are positive and statistically significant at a 1% level for the trend-shift model. These results are supporting the results of Feldstein (1983) and Boyd et al (2001) for inflation; Tiryaki et al. (2018) for industrial production index.

6. Conclusion

This study examined the impact of two key macroeconomics variables on Sustainability Index of Borsa Istanbul, using Fourier-based cointegration test for monthly observations covering the period January 2015-April 2025. The economic variables are consumer price index and industrial production index as for nominal and real economic terms, respectively.

Because of Türkiye's economic situation, there are several economic turbulences. These turbulences also affect stock market prices via positive or negative shocks. That is one of the important reasons why linear regression methods are not fitting for Türkiye. Thus, Fourier-based analysis methods were used in the study. Fourier-based stationary and cointegration tests allow an unknown number and type of breaks. The analysis indicated that there is a positive and significant linkage between the Sustainability Index and macroeconomic variables.

For investors, it is very important to be aware of the variables that could affect the value of the assets they own. Especially for individual or institutional investors with a sensitivity to sustainability, being aware of the factors that could affect the stocks in

a specific group they have chosen (in this study, the BIST Sustainability Index) is very important for their potential risk perceptions. In this regard, the study aimed to measure the impact of two important macroeconomic variables, inflation and the industrial production index, on the BIST Sustainability Index, albeit in a limited scope. Especially considering the scarcity of studies that take structural breaks into account based on the Fourier approach, this study is expected to serve as a guide for future research in the relevant field.

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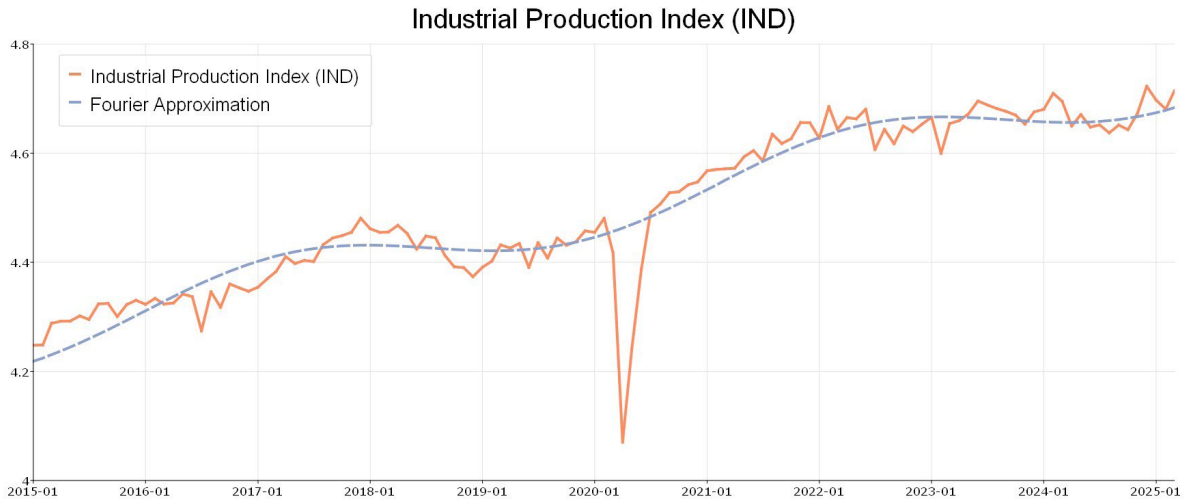
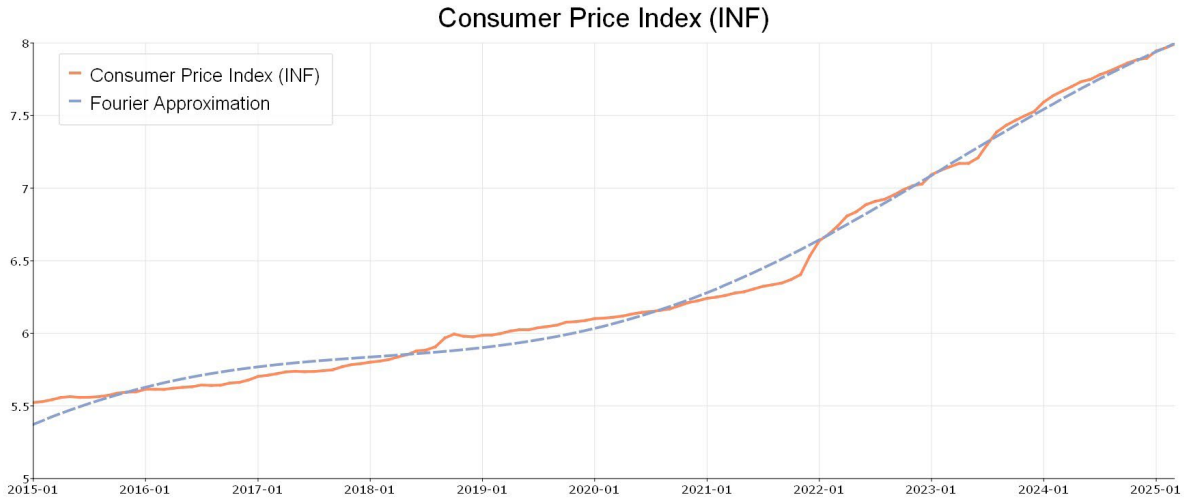
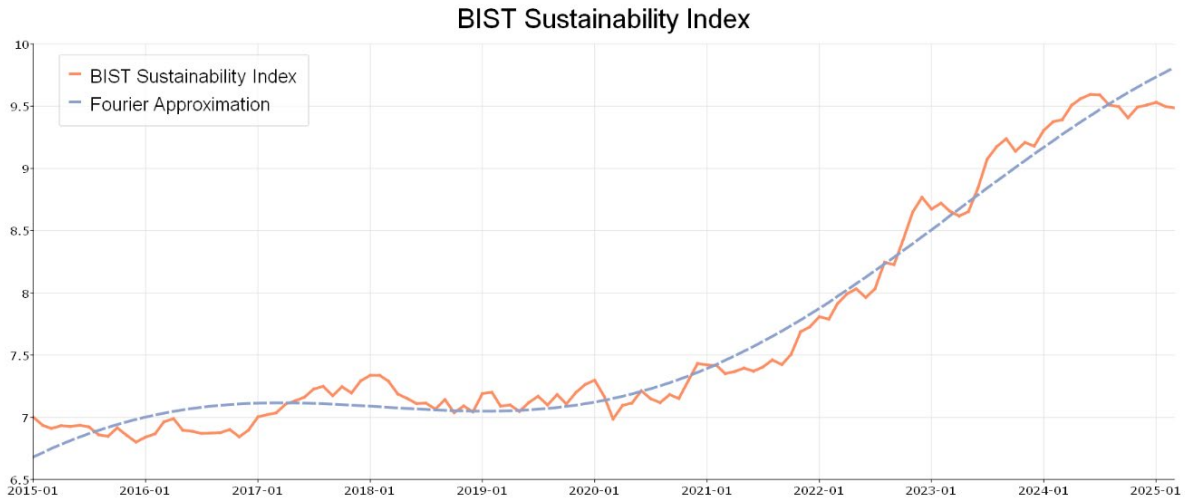
Appendix 1

The Variables' Historical Values and Their Fourier Approximations







Research Article

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Hybrid Work and Sustainable Employment: A Study on Female Employees in Türkiye[1]

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Abstract

In recent years, hybrid working systems have emerged as a transformative development in the structure of modern work. However, most existing research has primarily examined the economic advantages of hybrid work for organizations often overlooking its broader societal impacts, particularly those concerning women's employment. The broader implications of hybrid work across different cultural and social contexts also remain insufficiently explored. This gap has recently been highlighted by Shore et al. (2025) Accordingly, this research aimed to explore how hybrid work affects the well-being, work-life balance, and organizational commitment of female workers within the context of Türkiye. A structured survey which consists of five sections: demographic questions; "Hybrid Working Evaluation Form" developed by Yosunkaya (2023); "Organizational Commitment Scale" developed by Allen & Meyer (1990); "Employee Well-being Scale" developed by Pradhan & Hati (2022) and "Work-Life Balance Scale" developed by Apaydın (2011) designed. Hofstede's (2025) country map was used to evaluate findings in the cultural context. 384 females participated to this research who are working in banking industry. They were chosen based on purposive sampling. Findings demonstrated that hybrid work environment positively affecting well-being however, negatively affecting work-life balance. This study further reveals that while well-being is positively influencing; work-life balance is negatively influencing organizational commitment. This underscores the importance of strategy and culture-based hybrid work policies to not only promote well-being but also prevent work-life imbalances.

Keywords: Hybrid Work, Employee Well-Being, Work-Life Balance, Organizational Commitment, Sustainability.

JEL Codes: Q01, D23, J01, M14

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1. Introduction

In recent years, hybrid working systems have emerged as a transformative development in the structure of modern work. However, most existing research has primarily examined the economic advantages of hybrid work for organizations often overlooking its wider societal impacts, particularly those concerning women's employment. Implications of hybrid work across different cultural and social contexts also remain insufficiently explored. In fact, most empirical research continues to be concentrated in Western contexts, where individualistic cultural values, low power distance, and low uncertainty avoidance dominate workplace dynamics (Setiyono et al., 2024). However, in these studies, the focus has largely remained on understanding hybrid work effect on employees' well-being and productivity within these cultural frameworks, leaving significant questions unanswered regarding how such work models function in non-Western societies, where workplace dynamics are shaped by distinct cultural, institutional, and social frameworks. This gap has recently been highlighted by Shore et al. (2025) and the authors called for future research to explore how employee-organization relationships and employee health outcomes are influenced by evolving work arrangements, particularly in non-Western contexts where cultural values and organizational expectations may diverge significantly from those prevalent in the West. In fact, hybrid work has demonstrated potential well-being benefits for certain groups such as working parents, disabled employees, female and disadvantaged individuals however, these findings are predominantly drawn from Western labor markets, which diminishes their generalizability across different cultural landscapes (Shore et al., 2025).

To respond to the identified research gaps, the present study aims to go beyond examining the direct associations between hybrid work and employee outcomes by investigating how and through which mechanisms hybrid work influences organizational commitment. Specifically, the study adopts a mediation-based approach to explore the dual roles of employee well-being and work-life balance as underlying explanatory variables. By drawing on the literature, the study integrates theoretical insights into a structured empirical model. Furthermore, by applying Baron and Kenny's (1986) mediation framework along with bootstrapped structural equation modeling, the research seeks to uncover not only whether hybrid work influences commitment, but also through which psychological and relational pathways these effects occur. In addition, this study proposes a context-sensitive conceptual model that incorporates Hofstede's cultural dimensions to interpret how national values such as high power distance, low individualism, and strong uncertainty avoidance may shape the effectiveness and perception of hybrid work systems. Through this multidimensional and culturally informed design, the research aims to contribute a novel and empirically grounded framework to the hybrid work literature, particularly within underrepresented non-Western contexts.

Accordingly, exploring hybrid work effect on the well-being, work-life balance, and organizational commitment of female workers within the context of Türkiye has been determined as the aim of this study. Türkiye was chosen for several reasons. First of all, it is a non-Western culture representor. Secondly, in Türkiye, women are culturally referred as mothers rather than workers. This can be seen in the country's workforce structure. In fact, according to the Turkish Statistical Institute (2024) (TÜİK (Türkiye İstatistik Kurumu), 2024) the overall employment rate for individuals aged 15 and above stands at 47.5%. This figure diverges sharply by gender: 30.4% for women and 65.0% for men, indicating the existence of a significant gender gap in workforce participation, with the female employment rate being nearly half that of men. Another reason for selecting Türkiye is related to the current economic needs of the country. As a developing economy currently facing economic challenges, increasing female participation in the workforce remains a critical challenge for Türkiye. Indeed, studies indicate that increasing women's labor force participation directly contributes to economic growth and long-term economic sustainability (Vasconez Rodriguez, 2017). In fact, one of the latest study's conducted in Türkiye indicated that a 0.12% increase in economic growth is observed if a 1% increase in women's labor force participation is achieved (Çiğdem et al., 2023), making the country a highly relevant context for this research.

Accordingly, this research aims to produce evidence-based insights that can guide the development of gender-sensitive and actionable policies in hybrid work environments, making it possible for the country to achieve more inclusive and resilient workforce structures and overall sustainable economic development. The present research's results also provide a good example for countries that have similar cultures to Türkiye, in which women's participation in the workforce are low and may offer as a key factor to achieve sustainable development. This research also provides a good example for countries that have similar cultures to Türkiye, in which women's participation in the workforce are low and may offer valuable insights for sustainable development. In this perspective, the present research contributes not only to the academic understanding of hybrid work arrangements but also to the broader conversation on sustainable workforce engagement, gender equality, and social inclusion. Moreover, this study enriches established theoretical frameworks by offering a culture-based hybrid working model that increases the organizational commitment that makes it also valuable for business and academic world.

2. Theoretical Background and Formation of Hypotheses

In this part of the research, existing studies in the literature were examined and hypotheses were created.

2.1. Hybrid Working

Although no universally accepted definition of hybrid work exists (Lauring & Jonasson, 2025), it is generally described as a work arrangement that integrates remote work with traditional office-based work, offering employees and organizations greater flexibility in structuring work processes (Shao et al., 2024). Hybrid work came into life in reaction to the changing demands of the modern workforce (Claes et al., 2023), challenges faced by the world because of the pandemic, and energy saving efforts of companies to become greener (Andriani, 2023).

Mortensen & Haas (2021) evaluated this working model in terms of its advantages compared to remote and office-based systems. According to them, hybrid working is defined as an effective system that offers benefits such as reducing commuting time, increasing flexibility and providing cost optimization to companies, as well as improved coordination and team creativity through the partial continuation of face-to-face work (Mortensen & Haas, 2021).

It is possible to say that hybrid working systems offer benefits from a wide perspective, from employees to businesses, and from businesses to sustainability (Andriani, 2023). From the employees' perspective, research shows that hybrid work is closely linked to enhanced work-life balance, reduced stress levels, and improved job satisfaction (Lauring & Jonasson, 2025). Similarly, hybrid working systems increase employees' control over their work, improving their psychological well-being and reducing work-related anxiety, thus helping to develop a more adaptive and inclusive workplace culture (Lauring & Jonasson, 2025). In addition, by allowing employees to customize their schedules, hybrid work models promote greater job satisfaction and organizational commitment, contributing to the overall sustainability of businesses (Bekele et al., 2024).

From a business perspective, hybrid work systems offer significant contributions to organizations. In fact, hybrid work contributes to the economic sustainability of businesses by reducing costs, enhancing employee productivity, maximizing business efficiency and supporting labor market inclusivity (Xie et al., 2025). Indeed, research on the subject shows that organizations adopting hybrid models have reported lower turnover rates, higher employee engagement, and improved talent retention (Brundtland, 2018). In addition, hybrid working reduces the need for office space, allowing businesses to reduce rental costs and energy costs, operate with an optimized workforce, and attract talent from a wider geographical area (Mortensen & Haas, 2021).

From a sustainability perspective, the hybrid work system provides benefits in three main categories: economic, social, and environmental. In this context, increasing workforce resilience, operational efficiency, and resource optimization contribute to sustainable economic development; while ensuring equitable, inclusive, and supportive workplaces that foster employee well-being, diversity, and long-term professional engagement contribute to social sustainability (Andriani, 2023). Reducing carbon emissions, optimizing resource consumption, and minimizing the ecological footprint of corporate operations are among the key contributions the hybrid work system makes to environmental sustainability (Andriani, 2023).

From a gendered perspective, hybrid working systems offer a meaningful opportunity to strengthen women's participation in the workforce and promote gender equality on a broader scale (Elsawy & Youssef, 2023). Indeed, one of the system's important features is it's promotion of gender equality (OECD, 2017). For female employees, the system offers a unique opportunity to address long-standing gender disparities in the labor market. Historically, rigid office structures and inflexible working hours have had extremely negative effects on women, particularly those who undertake caregiving and household responsibilities (OECD, 2017) and in economies where cultural and societal expectations create barriers to full-time employment (Elsawy & Youssef, 2023). The OECD (2017) report shows that female workers experience more work-life conflict compared to male workers which causes career stagnation, higher burnout rates, and an increased likelihood of exiting the workforce. A hybrid working system can help reduce these problems. As a result, they can be better positioned to progress into leadership roles without sacrificing personal obligations.

When examined from the perspective of inclusivity, increased female participation in the workforce due to hybrid working systems directly supports at least nine of the 17 Sustainable Development Goals (SDGs) (United Nations, 2025). In this regard, hybrid work should not be viewed solely as a flexible employment arrangement, but rather as a strategic enabler of social inclusion (Caragnano, 2023), a mechanism for reducing inequality (Vasconez Rodriguez, 2017), and a pathway toward the economic empowerment of women (Elsawy & Youssef, 2023).

Although the hybrid working model offers clear and tangible benefits, it also brings with it several challenges that businesses should consider (Tenderis & Kazdal, 2023). In fact, Hybrid work arrangements inherently differ from fully remote or entirely on-site models, presenting a unique set of challenges (Claes et al., 2023). Claes et al. (2023) identify four major

challenging features of the hybrid working system. According to Claes et al. (2023), the first challenge arises from the loss of boundaries between professional and personal responsibilities (boundarylessness), which makes it difficult to disengage from work. Multitasking is another challenging feature proposed by Claes et al. (2023), as hybrid work often requires employees to manage multiple work tasks simultaneously within the same timeframe, leading to a constant need to prioritize competing responsibilities. Differing from remote workers, many hybrid workers lack a separate place to work in their homes, which makes them more vulnerable to non-work-related interruptions (Vartiainen & Vanharanta, 2023). This is stated by Claes et al. (2023) as a third challenging feature of hybrid working, as it leads to decreased concentration on work and leads to decreased overall performance. A final challenging feature is stated by Claes et al. (2023) as the "demand for continuous learning". In this context, Xie et al. (2019) claimed that this working system requires a continuous adaptation of new technologies and requires employees to update their skills to stay competitive in a rapidly evolving workplace. Indeed, hybrid working system can negatively affect team harmony and employee loyalty (Setiyono et al., 2024). In addition, a hybrid working system may diminish the borders associated with work and individual tasks. This can cause employees to work beyond standard working hours, potentially leading to burnout (Setiyono et al., 2024).

The hybrid work system can also trigger psychological and behavioral difficulties that can cause disruptions in career development, decrease workplace commitment, and complicate the management of personal responsibilities (Kinsman et al., 2024). For example, managers may unknowingly prefer employees with whom they interact more frequently face-to-face, potentially leading to biases in promotion and career development processes (Kinsman et al., 2024). Similarly, communication gaps may occur between teams working remotely and those working in the office, weakening collaboration and the flow of information, which in turn can lead to a decrease in workplace engagement (Tenderis & Kazdal, 2023). Again, this working system can cause distraction and stress due to factors such as high noise levels and lack of private space in the home environment, potentially leading to mental fatigue, while frequent requests for information sharing may further interrupt workflow and make it more challenging to manage personal responsibilities (Kinsman et al., 2024). Finally, ensuring the security of digital infrastructure is of great importance in a hybrid working system, as the risk of a data security breach increases in this environment. These challenges clearly reveal the need for policies structured to maximize the advantages of hybrid working while minimizing its negative effects (Tenderis & Kazdal, 2023).

Given the complex and context-dependent nature of hybrid work experiences, cultural values play a critical role in shaping how such arrangements are perceived and managed by employees. In Western cultures, hybrid work tends to strengthen well-being and commitment through enhanced autonomy and flexibility. In contrast, in Eastern cultures, these same elements may increase job demands, unless culturally sensitive leadership and structured organizational support are in place to provide clarity and mitigate uncertainty (Başar, 2024). In Western cultures, characterized by low power distance, high individualism, and low uncertainty avoidance, autonomy and flexibility, which are central to hybrid work models, are generally perceived as positive job resources. Employees in these contexts are accustomed to making independent decisions, managing their own schedules, and thriving in environments that offer discretion over work processes. Consequently, autonomy fosters a sense of control, enhancing well-being and facilitating work-life balance. Flexibility, similarly, enables individuals to manage both professional and personal responsibilities effectively, reducing role conflict and increasing satisfaction (Yosunkaya, 2023).

However, in Eastern cultures such as Türkiye, which exhibit high power distance, high uncertainty avoidance, and collectivism, the perception of these same work characteristics shifts. In these settings, autonomy may no longer function as a resource but rather transform into a demand. The hierarchical nature of high-power distance societies emphasizes top-down decision-making, where employees are more comfortable receiving direct instructions from their superiors. When autonomy is granted without structured guidance, it can create ambiguity and stress, particularly in cultures where uncertainty avoidance is strong and individuals seek clear rules and predictable environments. Therefore, flexibility in hybrid work settings, which inherently introduces variability in work schedules and responsibilities, might also be perceived as an additional source of uncertainty rather than a benefit (Başar, 2024).

The collectivist orientation further complicates the reception of hybrid work. In collectivist cultures, face-to-face interactions, group cohesion, and shared decision-making are essential components of workplace dynamics (Hofstede et al., 2010). Hybrid work, by reducing physical presence and increasing remote interactions, can inadvertently weaken social bonds, erode trust, and disrupt team dynamics. As a result, employees may experience diminished well-being and reduced work-life balance, particularly when organizational support systems are insufficient to bridge these gaps. Interestingly, cultural factors can also mitigate these negative outcomes under certain conditions. For instance, the femininity dimension, which emphasizes quality of life, care, and cooperation, can enhance the perception

of job resources, even in more hierarchical cultures (Lauring & Jonasson, 2025). In societies where femininity is stronger, supportive leadership, structured policies, and psychological safety can counterbalance the stress induced by high demands, fostering well-being and enhancing organizational commitment. Considering these cultural differences will be base for the hypothesis development which will be done in the next section.

2.2. Hybrid Work and Work-Life Balance

A critical longstanding issue which has been questioned since the beginning of working life has been how employees achieve work-life balance, and how this affects their health and performance. Today, this issue is generally explained by the Work-Family Conflict (WFC) Theory (Greenhaus & Beutell, 1985) which is related to the idea that employees have both work and home lives, and that they have their own set of responsibilities in each of these lives (Sohal & Sharma, 2024). For example, a female employee can be a mother at home, fulfilling her maternal responsibilities, while simultaneously serving as a manager at work with administrative duties. Since these two responsibilities are carried out concurrently, they can sometimes lead to conflicts over shared resources such as energy and attention (Sohal & Sharma, 2024).

Work-Family Conflict occurs in two ways. The first of these emerges as work life interference with family life (WIF). For example, a mother's inability to attend her child's school activities due to long working hours is an example of WIF. Family life interference with work life (FIW) is exact opposite of WIF and constitutes the second dimension of Work-Family Conflict. For example, a mother being late for work due to her child's illness is an example of FIW. Both ways negatively impact the mental and physical health of individuals, thereby decreasing organizational performance and employee commitment while increasing turnover rates.

When studies are surveyed, the issues that trigger work-life conflict the most are workload, time pressure, and gender roles, with the resulting effects including stress, depression, and low life satisfaction (Xie et al., 2025). Women are more likely than men to experience work-life conflict, which increases their risk of career stagnation, burnout, and eventual withdrawal from the labor force (OECD, 2017). Hybrid work may help reduce these risks by allowing women to handle both their professional and individual tasks more effectively. In fact, in contrast to traditional work structures, technological developments and flexible working styles in the modern business world continue to trigger conflict, however they create opportunities for balance (Lauring & Jonasson, 2025). Recent studies have shown that hybrid work arrangements play an effective role in maintaining work-life balance (Mishra & Bharti, 2024). This effectiveness stems from features such as the flexibility and autonomy that hybrid work systems provide employees in creating their own work schedules and in reducing the time spent commuting (Liu, 2022). In this context, it has been stated that hybrid work reduces stress caused by work-life balance and increases job satisfaction (Liu, 2022). In addition, other studies have shown that granting employees more autonomy in determining their work arrangements through the hybrid work system increases psychological well-being, reduces work-related anxiety, and promotes a more harmonious, inclusive workplace culture (Lauring & Jonasson, 2025). Likewise, Liu (2022) indicated that hybrid working systems increase productivity, reduces stress, and strengthen employee commitment to their organization. Andriani (2023) on the other hand, found that hybrid working combined the advantages of remote and office-based working, allowing female managers to have more control over their schedules and maintain their professional commitment.

A similar study conducted by Yosunkaya (2023) with 400 people working in hybrid arrangements in Türkiye also supported these findings. Yosunkaya (2023) found that 86.8% of participants were satisfied with hybrid working and supported making the model permanent. However, despite its advantages, and in contrast to the findings of Andriani (2023), a significant portion of participants (66%) expressed concerns about the elimination of specific working hours. Participants also reported that they felt pressured to be constantly accessible outside of standard working hours (Yosunkaya, 2023). According to Yosunkaya (2023), this situation leads to negative consequences such as increased stress levels and work-family conflict. At this point, unresolved conflicts between work and personal responsibilities have been found to create dissatisfaction in the workplace and intention to leave one's job (Yosunkaya, 2023).

Several other studies further report that hybrid work has negative effects, such as da Silva et al. (2022). According to their findings, hybrid work systems offer flexibility to employees, but also present several challenges especially for female managers in terms of career visibility and promotion opportunities. However, some studies also showed that the hybrid model can create a sense of having to be constantly available among employees, leading to additional stress, diminishing the anticipated benefits of flexibility (Selvaraju, 2024).

According to Selvaraju (2024), in order to address the challenges that hybrid work system may create, institutions need to develop policies to maintain work-life balance, promote practices that will reduce the feeling of constant connection, and support a corporate culture that values employee well-being

as much as professional performance. In support of Selvaraju (2024), Setiyono et al. (2024) also suggested that the success of an effective hybrid working system that promotes better work-life balance largely relates to how organizations integrate technology, leadership strategies, and well-structured policy practices. In other words, employees' work-life balance experiences are shaped by the overall work-family culture within organizations. Organizational environments that prioritize flexibility and employee well-being reduce work-family conflict and increase job satisfaction (Liu, 2022). Accordingly, it has been stated that when effectively implemented, hybrid work systems increase employee well-being, lower turnover rates, and contribute to the formation of a more committed and resilient workforce (Setiyono et al., 2024).

Empirical findings reveal that hybrid working systems have complex consequences on work-life conflict, and that achieving positive outcomes depends on organizational cultures supported by well-structured hybrid work. It is also clear from the findings of other studies that different country settings created different results and study conducted in Türkiye indicated that unclear working hours raised by the hybrid working leaded to stress in which the employees felt pressured to be constantly accessible outside of standard working hours (Yosunkaya, 2023). Thus, this situation has led to negative consequences such as increased stress levels and work-family conflict. Based on this, the first hypothesis for this study is set as "hybrid work has a negative effect on work-life balance" (H1).

Research has also shown that job satisfaction and organizational commitment are positively affected by an increased work-life balance through the hybrid work system (Bekele et al., 2024). The study by Saritha & Akthar (2024) also revealed similar results. Accordingly, they found that organizations adopting a hybrid model experience lower employee turnover rates and higher employee commitment (Saritha & Akthar, 2024). In support of these results, Brundtland (2018) also stated that the hybrid work system, which he argued is of critical importance in building a sustainable economic structure, also has positive effects on retaining talented employees. Nevertheless, some studies also suggested that increased flexibility and autonomy offered by the hybrid working systems may lead to negative outcomes such as work intensification, boundary blurring, or professional isolation, especially in non-Western or high-context cultures (Başar, 2024). Başar's (2024) indication is done in the case of Türkiye and thus in this study it is expected that increased flexibility and autonomy offered by the hybrid working systems will lead to negative outcome and thus the second hypothesis is set as "work-life balance has a negative effect on employee commitment" (H2).

2.3. Hybrid Work and Employee Well-Being

Employee well-being is a critical pillar of workforce sustainability, influencing job performance, mental health, and overall organizational engagement (Din et al., 2025). Many studies have benefited from the Job Demands-Resources (JD-R) Model to examine the topic of employee well-being (Bakker & Demerouti, 2007).

In simple terms, JD-R defends that factors affecting employee well-being in addition to employees' health, motivation, and performance, mostly arise from two sources: job demands and job resources (Dlouhy et al., 2024). Dlouhy et al. (2024) describe job demands as "job requirements," which include the physical, emotional, or cognitive effort required to carry out work tasks. They further add that the mentioned efforts are significantly related to stress and strain among employees. This is supported by Bhargavi (2025) who claim that job-related efforts are often perceived as an "excessive workload," leading to feelings of time pressure, and role ambiguity in employees. This, as a result, may lead to burnout, emotional exhaustion, and disengagement (Bhargavi, 2025). Other scholars such as da Silva et al. (2022) further support these arguments and claim that high job demands predict future burnout, which, in turn, increases the risk of depression. In fact, their study on teachers (da Silva et al., 2022) demonstrates that workload and time constraints negatively impact employees well-being. On the contrary, when job resources are considered, da Silva et al. (2022) define these as organizational, social, or personal assets that help employees achieve their work goals. These resources ultimately serve to decrease stress and improve well-being. Examples of these include autonomy, colleague support, job security, and career development opportunities. Empirical studies highlight that colleague support can lower the negative impact of job demands, enable higher motivation, and improve job satisfaction (Bhargavi, 2025). Similarly, research carried out among Belgian employees indicated that autonomy and a sense of competence, both personal assets, positively correlate with subjective well-being (Villiger & Hämmig, 2023). The same study also revealed that job demands have an adverse effect on well-being. da Silva et al. (2022) add that the intensity of job demands may vary depending on the level of resources available within the organization. Supporting the idea, Selvaraju (2024) argued that effective leadership, structured policies, and a supportive work culture can help reduce stressors and optimize the benefits offered by job resources. Research on Portuguese teachers (da Silva et al., 2022) and Swiss healthcare workers (Villiger & Hämmig, 2023) further supported this view.

The hybrid working system has been widely recog-

nized by recent studies such as Mortensen & Haas (2021) as a working model that can enhance employee well-being through decreasing stressors related to the workplace, offering greater autonomy over employees' work, and promoting a stronger sense of control over work dynamics. Studies have shown that providing employees with greater autonomy in choosing their work arrangements enhances psychological well-being and supports more adaptive workplace culture (Sun et al., 2025). Furthermore, the hybrid model reduces commuting-related stress, increases job satisfaction, and positively influences psychological resilience (Sun et al., 2025).

In this regard, Başar (2024) argue that if organizations aim to support the well-being of female managers, they must adopt hybrid working systems. However, Başar (2024) also added that fostering resilience at work and developing workplace policies sensitive to female specific needs is equally important when adopting hybrid working models. This is because, despite its identified benefits, hybrid working systems may also raise problems for women which can negatively impact their well-being. Bhargavi (2025) further supported the ideas of Başar (2024) and claimed that if hybrid work models fail to address gendered challenges such as leadership visibility, equitable career progression, and social support, they may increase stress and ultimately reduce female managers' long-term engagement in leadership roles. Data from OECD (2017) further underscores the persistence of these issues, with the report stating that without targeted policies which address such problems, hybrid work may risk increasing existing gender-based inequalities instead of supporting equality within workplaces.

Studies also indicate that women working remotely often experience increased pressure from household responsibilities, which increases tensions in their families as well as causing difficulties in maintaining productivity and professional visibility (Elsawy & Youssef, 2023). These problems may be exacerbated due to the social isolation created by working from home and thus contribute to elevated levels of stress and anxiety. As a result, the career sustainability of female employees is negatively affected (Başar, 2024). At this point the OECD (2017) report indicates that organizational support systems such as mental health resources, mentorship programs, and clear guidelines on work expectations decrease the aforementioned stressors and increase the effectiveness of hybrid working systems.

Further research highlights both the benefits and risks associated with working from home (WFH) and hybrid work models, particularly for women (Gorjifard & Crawford, 2021). Gorjifard & Crawford (2021) state that while the hybrid working system offers increased autonomy and flexibility for female workers, it also presents occupational health and safety concerns. Specifically, women who are working from home are more subject to health and safety issues because of their domestic responsibilities. Additionally, the absence of a dedicated workspace at home leads to higher personal costs, as employees need to invest in a functional workstation to maintain productivity. This absence of a functional workstation also puts further pressure on women since they also need to catch-up with rapidly evolving workplace technologies (Gorjifard & Crawford, 2021).

It is understood from literature that especially non-western studies indicated negative outcomes. Nevertheless, this study focusses on banking employees where long working hours and high-pressure significantly exist. In addition, many banking general offices are in city centers which require long travelling time that increases stress and decreases well-being. Therefore, based on the sample of this study it is, in this manner, hypothesis that hybrid work will have a positive effect on the well-being of female employees (H3). Additionally, it is proposed that well-being functions in shaping organizational commitment and its effect on it will also be positive (H4).

2.4. Hybrid Work and Organizational Commitment

Many scholars apply the Three-Component Model of Commitment (TCM) to explain organizational commitment (Cassim et al., 2024). Developed by Allen & Meyer (1990), this model categorizes commitment into three fundamental dimensions: affective commitment, continuance commitment, and normative commitment. For female employees, organizational commitment is a critical factor not only for sustaining engagement and professional development but also for reducing turnover intentions, increasing job satisfaction, and supporting long-term leadership retention (Saritha & Akthar, 2024). However, Cassim et al. (2024) argue that hybrid working systems present both opportunities and challenges that can either strengthen or weaken female employees' commitment. This is backed by their empirical findings. Specifically, Cassim et al. (2024) conducted a study with 133 academic staff members at a private higher education institution applying the Three-Component Model (TCM). Their findings revealed that while both work-from-home (WFH) and hybrid working system created challenges for employees, their affective and normative commitment remained stable (Cassim et al., 2024). Nevertheless, as mentioned earlier, hybrid working systems alone do not eliminate gendered barriers to the career progression of female employees. Research indicates that women in hybrid settings often face challenges related to workplace visibility, unfair promotion decisions, and reduced access to leadership development

opportunities due to reduced in-office presence (OECD, 2017). Indeed, unless hybrid working systems are structured to actively promote leadership inclusivity and career development, they may fail to retain top female talent in managerial positions (Saritha & Akthar, 2024). Building on this perspective, studies indicate that hybrid work significantly influences organizational commitment in industries with highly flexible and technology-driven environments (Vidya Sri & Vasantha, 2024). A study investigating the effectiveness of hybrid work structures in IT companies examined two dimensions (1) the effectiveness of hybrid workplace models and (2) the determinants of organizational commitment (Vidya Sri & Vasantha, 2024). Their findings demonstrated that well-structured hybrid models enhance workers' engagement and long-standing commitment. This emphasizes that the success of hybrid work depends on strategic implementation, strong leadership and fair promotion opportunities (Vidya Sri & Vasantha, 2024). Based on their findings, Vidya Sri & Vasantha (2024) concluded that hybrid work policies should not only provide flexibility but should also address gender-specific barriers in leadership and career progression as without these structural supports, hybrid working systems carries the risk of increasing gender inequalities rather than reducing it. Further research conducted by Bhargavi (2025) highlights that organizations with strong mentorship programs, leadership development initiatives, and transparent promotion criteria are more successful in promoting long-term organizational commitment among female employees. Addressing these barriers requires a holistic approach, incorporating mentorship opportunities, structured leadership pathways, and transparent performance evaluations that ensure female managers are equally considered for career advancement in hybrid work settings.

However, an alternative viewpoint suggests that when employees achieve better work-life balance, they may feel less dependent on their organizations and thus less committed. This shift in career priorities could lead female employees who achieve sustainable work-life balance to prioritize personal fulfillment over long-term loyalty to an organization (Bhargavi, 2025). Another study by Marozva & Pelser (2025) claimed that greater autonomy in hybrid settings may reduce employees' sense of belonging, potentially weakening their long-term organizational commitment.

It is clear from the literature that hybrid work has a positive influence on organizational commitment among female employees however, if it is introduced carefully. Therefore, in this study, it is hypothesized that hybrid work will have positive effect on organizational commitment (H5).

In the conceptual framework of this study, work-life balance is proposed as a key mediator linking hybrid work to organizational commitment. The rationale stems from work–family interface theories which suggest that a harmonious balance between work and personal life can translate into positive work outcomes. Empirical research shows that improved work-life balance is associated with higher job satisfaction and stronger organizational commitment (Liu, 2022; Bhargavi, 2025). This means that when employees are able to fulfill both work and family responsibilities without conflict, they are more likely to develop loyalty and remain engaged with their organization. Hybrid work arrangements, by reducing commuting time and offering scheduling flexibility, have the potential to lessen work-family conflicts and thereby improve work-life balance. In turn, a better work-life balance should foster greater commitment to the organization, as employees experience less stress and more support in managing their twofold roles. Recent evidence supports this connection: for example, a study in Ghana's higher education sector found that work-life balance significantly mediated the relationship between flexible work arrangements and employee performance (Eshun & Segbenya, 2024), underscoring how critical balance is for translating flexible work benefits into positive outcomes. Conversely, if hybrid work blurs boundaries and extends work into personal time, it may erode work-life balance and diminish organizational commitment. Some scholars caution that in cultures with strong family obligations or "always-on" expectations, employees who achieve a comfortable work-life balance might become less dependent on their jobs, and thus less emotionally committed to their employers. Başar (2024), for instance, observed that in non-Western contexts the added autonomy from hybrid work can sometimes lead to boundary-blurring and professional isolation, reducing hybrid work's intended benefits. Given these inconsistent findings, this study treats the hybrid work–work-life balance–commitment linkage as an open empirical question. Therefore, in this study it is hypothesized that hybrid work will have a negative effect on the work-life balance and that work-life balance in turn will have a negative effect on organizational commitment (H6), potentially serving as a mediator of hybrid work's influence on commitment.

Employee well-being is another central mediator in this study, grounded in both the Job Demands-Resources (JD-R) theory and organizational psychology research on employee attitudes. The JD-R model posits that job resources such as flexibility and autonomy can boost employee well-being by reducing job-related stress and fulfilling basic psychological needs (Liu, 2022). Hybrid work environments often introduce valuable resources, for example, greater autonomy over work location and schedule, and relief from the stressors of commuting. Recent studies have widely recognized hybrid work as a model that can enhance well-being by decreasing workplace

stressors and giving employees more control over their work dynamics. Sun et al. (2025) found that allowing employees to choose their work arrangements improved psychological well-being and even fostered a more adaptive workplace culture. Such enhancements in well-being are expected to translate into stronger organizational commitment. When employees feel healthier, less stressed, and more supported, they are likely to develop more positive attitudes toward their employer and exhibit higher affective commitment. This aligns with social exchange theory which suggests that organizations that care for and invest in employees' well-being may cultivate a sense of reciprocity, prompting employees to respond with loyalty and commitment. Prior research indicates that well-being is closely tied to engagement and retention, for instance, Din et al. (2025) report that initiatives improving employee psychological well-being also elevate engagement levels at work which relate to commitment. Conversely, if hybrid work arrangements fail to safeguard employee well-being, employees' attachment to the organization might suffer. As Bhargavi (2025) argued, hybrid models that neglect gender-specific challenges can increase stress and ultimately reduce women's long-term engagement in their roles. Therefore, the extent to which hybrid work boosts organizational commitment likely hinges on its impact on employee well-being. Together with the prior hypotheses, this yields a mediational expectation. Therefore, the last hypothesis in this study is set as "hybrid work will have a positive effect on organizational commitment through the mediating role of employee well-being" (H7).

3. Materials and Methods

The present research aims to explore how hybrid work affects the well-being, work-life balance, and organizational commitment of female workers within the context of Türkiye as non-Western culture representor for two main reasons. Following a positivist and deductive approach, the following research model (Figure 1), which consists of the study's hypotheses is formed:

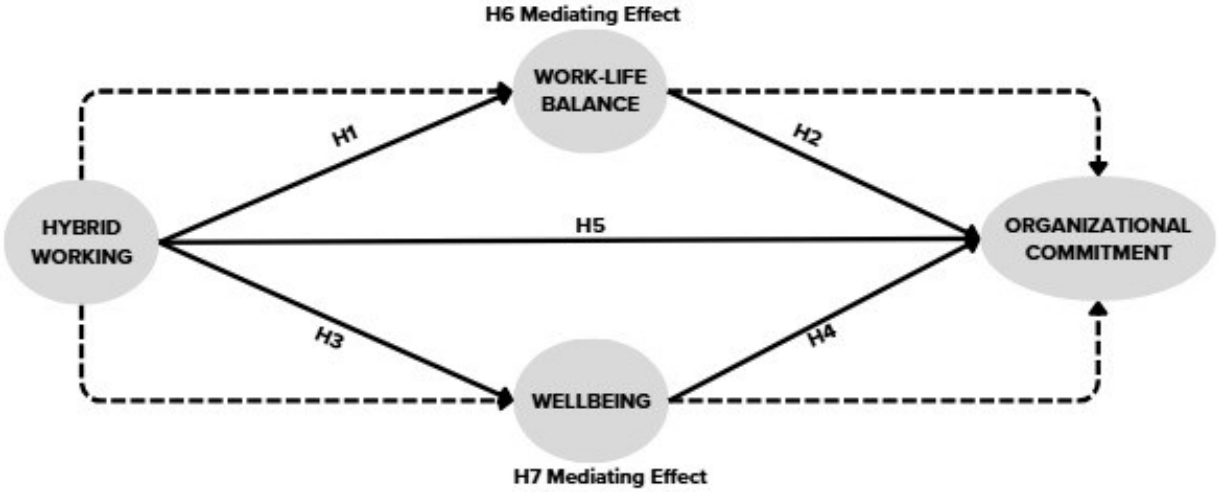


Figure 1. Research Model

A structured survey designed to assess the experiences of female employees working in hybrid environments. A structured survey which consists of five sections: demographic questions; "Hybrid Working Evaluation Form" developed by Yosunkaya (2023); "Organizational Commitment Scale" developed by Allen & Meyer (1990); "Employee Well-being Scale" developed by Pradhan & Hati (2022) and "Work-Life Balance Scale" developed by Apaydın (2011) designed.

Yosunkaya's (2023) scale features 14 questions and is structured as a five-point Likert-type measure. Allen & Meyer's (1990) scale comprises 3 subdimensions and 18 questions and uses a five-point Likert scale. Pradhan & Hati's (2022) scale has 4 subdimensions and 31 questions and uses a five-point Likert scale. Apaydın's (2011) scale consists of 4 subdimensions and twenty questions and uses a five-point Likert scale. To assess the culture, Hofstede's (2025) country map was used. Following Figure 2 provides Hofstede's (2025) country map for Türkiye used in this study:

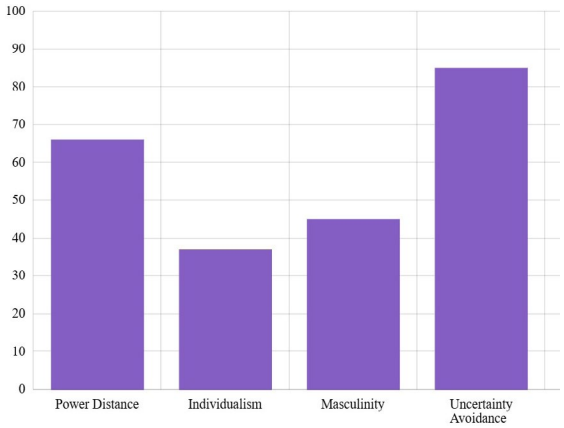


Figure 2. Cultural Dimensions of Türkiye

Source: Hofstede (2025)

This research was conducted among women working in a hybrid working system in the banking sector. The rationale behind selecting female employees working specifically in the banking sector is related to the study's focus on hybrid work, well-being, and work-life balance. The banking industry is known for its long working hours, high-performance expectations, and competitive environment which presents a relevant and high-pressure context to conduct this study. When looked at it, regardless of the working system such as hybrid working, remote working, or working in the office, the biggest problem faced by studies conducted in Türkiye is that the sample size cannot be determined because the number of employees is not included in official statistics (e.g. Yosunkaya, 2023). Yosunkaya (2023) stated in his study that the minimum sample size required for a research based on a population of 10000 at a 95% confidence level for quantitative-oriented social science research is 370, 381 for 50000, and 384 for 1000000. Based on this point, the number of women working in the banking sector was first determined within the scope of this research. According to the January 2025 report of the Banks Association of Türkiye, the number of women working in the banking sector in Türkiye is 96210. Accordingly, 384 samples were targeted in this study.

A purposive sampling approach was used to ensure that the sample consisted of female employees working in hybrid environments, aligning with the research objectives. Purposive sampling was selected as the primary method as the study specifically targets a defined group of professionals whose experiences with hybrid work directly relate to the research questions. However, given the constraints in accessing a broad range of female employees in hybrid roles, a convenience sampling approach was also applied during the data collection process. Participants were recruited through professional networks, LinkedIn, and corporate contacts, allowing for efficient access to relevant respondents while maintaining the study's focus on hybrid work experiences. Thus, the final sample consisted of 384 female employees who met the study's eligibility criteria: Female, working in banking sector in Türkiye, Actively working in a hybrid environment.

To ensure the validity and reliability of the scales used in the analysis, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted. Additionally, structural equation modeling (SEM) was applied to test the hypothesized relationships between hybrid work, work-life balance, employee well-being and organizational commitment. Descriptive statistics were used to summarize demographic characteristics and key survey responses, while inferential statistical techniques were employed to assess the strength and significance of the relationships between variables.

4.Findings

In this part of the research, descriptive statistics of demographic characteristics and scales, factor and reliability analyses of the scales, relationship analyses between the scales and relationship analyses between the sub-dimensions were given.

4.1. Descriptive Statistics of Demographic Characteristics

According to the descriptive statistics of demographic characteristics, it was observed that the majority of the participants were between the ages of 26 and 45. Specifically, 4% of participants were between 18 and 25 years old, 32% were aged between 26 and 35, while the largest proportion, 45%, belonged to the 36-45 age group. Additionally, 19% of participants were aged 46 and above. A significant portion of the participants were married, accounting for 62% of the sample, while 38% were single. When considering education levels, the majority of participants held a university degree, representing 67% of the sample. Moreover, 25% had obtained a master's degree, while 5% had completed a PhD. A smaller proportion, only 2%, had high school education as their highest level of academic achievement.

4.2. Descriptive Statistics, Factor and Reliability Analyses of the Scales

Table 1. Hybrid Work Environment / Descriptive Statistics, Exploratory Factor and Reliability Analysis Results

Name	Items	Average (X)	Std. deviation	Factor weights	Reliability (α)	Variance explained (%)
Hybrid Work Environment	hw_1	2,86	,59024	,863	,964	68,146
	hw_2	2,91	,55988	,830		
	hw_3	2,88	,59969	,833		
	hw_4	2,87	,63492	,848		
	hw_5	2,97	,62064	,805		
	hw_6	2,87	,59708	,822		
	hw_7	2,92	,55022	,834		
	hw_8	2,87	,61824	,867		
	hw_9	2,90	,60840	,842		
	hw_10	2,89	,59125	,822		
	hw_11	2,93	,59666	,818		
	hw_12	2,91	,59334	,811		
	hw_13	2,91	,60408	,811		
	hw_14	2,87	,57513	,746		

Kaiser-Meyer-Olkin (KMO): 0,966; Bartlett Test: 0,000

According to Table 1, KMO (0.966) and Bartlett test (lower than 0.001) strongly supported the applicability of factor analysis. The factor weights of all items ranged between 0.746 and 0.867. The high variance explained by a single factor (68.1%), in addition to the high factor loadings indicate that the scale has a unidimensional structure and measures the overall "Hybrid Work Environment" construct. Additionally, this structure aligns with the original scale, further confirming its unidimensional nature. Reliability analysis yielded a value of 0.964, indicating that the scale is highly reliable. The mean values for all items range between 2,86 and 2,97, indicating that participants generally provided responses close to the mid-point of the scale. The highest mean score was observed in hw_5 (2,97), while the lowest mean score was found in hw_1 (2,86).

Model fit indices are statistical measures used to assess how well a structural equation model aligns with the data. When the CMIN/df value is below 5, the model is considered to have an acceptable fit. AGFI and GFI are absolute fit indices, and values close to or above 0.90 indicate a good model fit (Gürbüz, 2024). Comparative fit indices such as NFI, CFI and IFI suggest a strong model fit when they exceed 0.90. The RMSEA value represents the approximate error rate of the model, with a value below 0.08 indicating an acceptable level of model fit (Meydan & Şeşen, 2015). In this study, the evaluation has been conducted based on these criteria.

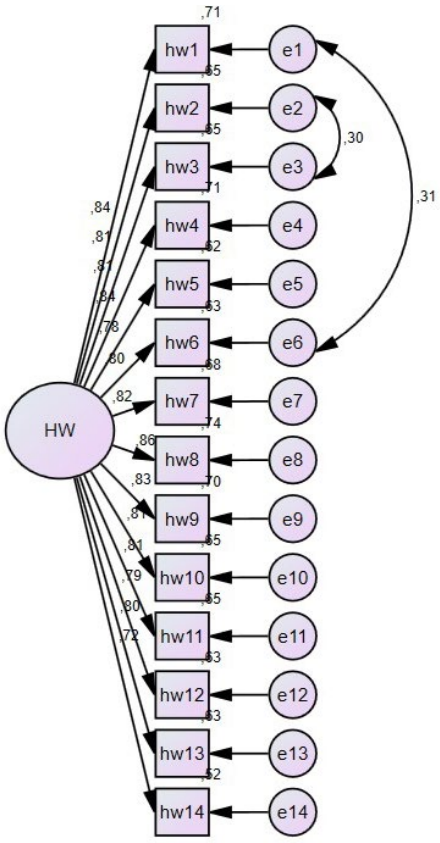


Figure 3. Hybrid Work Environment / Confirmatory Factor Analysis

According to Figure 3, the factor loadings ranged between 0.72 and 0.86, indicating a generally high level. To improve the model's goodness-of-fit, covariances were established between certain latent variables. In terms of the overall model fit, the CMIN/df (2.844) value was below 5, indicating an acceptable model fit. Among the absolute fit indices, AGFI (0.871) and GFI (0.908) suggest good overall model fit, although AGFI is at a borderline acceptable level. The indices NFI (0.946), CFI (0.964), and IFI (0.964) all exceed 0.90, indicating a strong model fit. Additionally, the RMSEA (0.077) value was below 0.08, further supporting the acceptability of the model fit. All these findings confirm that the factor structure of the "Hybrid Work Environment" scale is validated at an excellent level.

Table 2. Work-Life Balance / Descriptive Statistics, Exploratory Factor and Reliability Analysis Results

Name	Items	Average (X)	Std. deviation	Factor weights				Reliability (α)	Variance explained (%)
				1	2	3	4		
Work-Life Adjustment	wlb_1	4,18	,66906	,677				,842	33,585
	wlb_2	4,30	,60667	,898					
	wlb_3	4,36	,67177	,809					
	wlb_4	4,08	,72946	,675					
	wlb_5	4,01	,77311	,647					
Neglecting Life	wlb_7	3,46	,70263		,787			,877	13,892
	wlb_8	3,62	,96460		,714				
	wlb_9	2,93	,83861		,706				
	wlb_10	3,67	,63310		,800				
	wlb_11	3,94	,91603		,775				
	wlb_12	3,36	,74442		,829				
Taking Time for Yourself	wlb_13	3,41	,77644				,857	,785	12,173
	wlb_14	4,37	,90172				,797		
	wlb_15	3,67	,62286				,744		
	wlb_16	3,52	,69401				,871		
Life Consists of Work	wlb_17	3,62	,65487			,830		,871	8,676
	wlb_18	3,41	,70786			,855			
	wlb_19	3,81	1,00035			,890			
Total scale								,892	

Kaiser-Meyer-Olkin (KMO): 0,942; Bartlett Test: 0,000; Total variance explained: 68,326

According to Table 2, KMO (0.942) and Bartlett test (lower than 0.001) strongly supported the applicability of factor analysis. Items "wlb_6" and "wlb_20" were removed from the analysis as their factor loadings were below 0.60 and disrupted the factor structure. According to the analysis results, the scale consists of four sub-dimensions and is reliable (reliability coefficient 0.892). The mean values for all items ranged between 2,94 and 4,37, indicating that participants generally provided responses closer to the upper end of the scale, suggesting a positive perception of work-life balance.

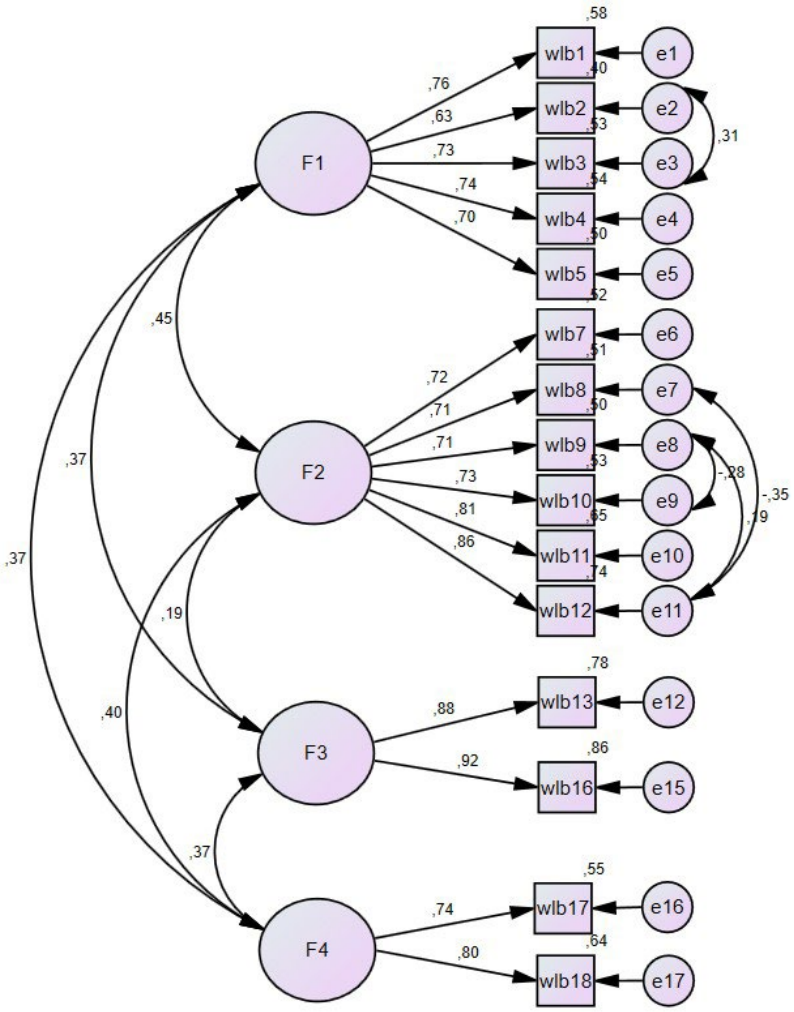


Figure 4. Work-Life Balance / Confirmatory Factor Analysis

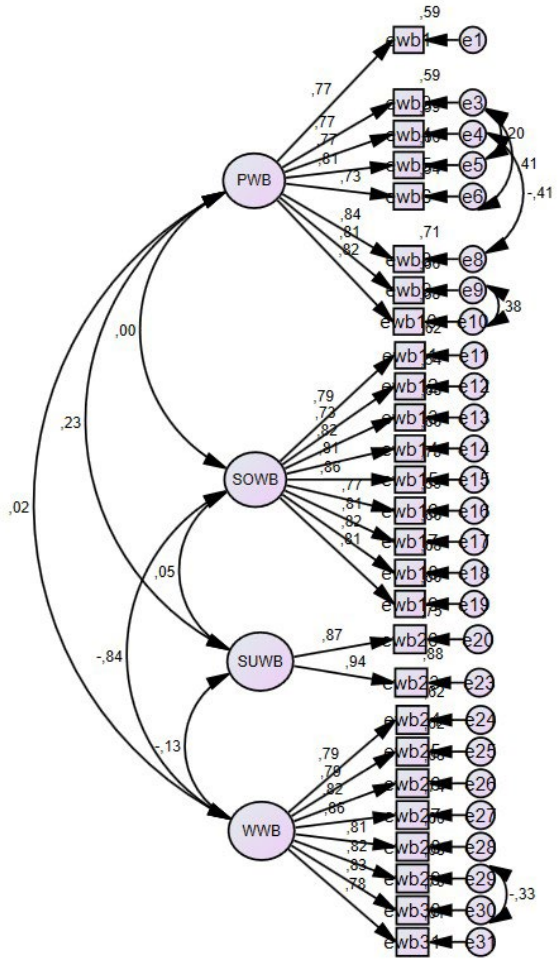
The items "wlb_14" and "wlb_15" were removed from the analysis as their factor loadings were below 0.60 and negatively affected the model fit (Figure 4). Additionally, the item "wlb_19" was also excluded from the analysis due to its high correlation with other items and a standardized factor loading exceeding the acceptable theoretical limits. As this condition negatively affected the model fit indices, the item was removed to improve overall model adequacy. As a result, the factor loadings in the model ranged between 0.63 and 0.92. To improve the goodness-of-fit values, covariances were established between some latent variables. Regarding the overall model fit, the CMIN/df (3.181) value was below 5, indicating an acceptable model fit. Among the absolute fit indices, AGFI (0.868) and GFI (0.912) suggest a good overall model fit, although AGFI is at a borderline acceptable level. The indices NFI (0.895), CFI (0.925), and IFI (0.926) were very close to and above 0.90, indicating a strong model fit. Additionally, the RMSEA (0.078) value was below 0.08, supporting the acceptability of the model fit. All these findings indicate that the "Work-Life Balance" scale demonstrates a good level of fit with the data and confirms the existence of four sub-dimensions.

Table 3. Employee Well-being / Descriptive Statistics, Exploratory Factor and Reliability Analysis Results

Name	Items	Average (X)	Std. deviation	Factor weights 1	2	3	4	Reliability (α)	Variance explained (%)
Psychological wellbeing	ewb_1	3,57	1,10020		,819			,945	22,529
	ewb_2	3,71	1,03948		,864				
	ewb_3	3,66	1,07289		,816				
	ewb_4	3,71	,95567		,765				
	ewb_5	3,63	1,04612		,822				
	ewb_6	3,62	,96460		,783				
	ewb_7	2,93	1,09767		,795				
	ewb_8	3,97	1,00128		,793				
	ewb_9	3,94	,91603		,828				
	ewb_10	3,47	1,02977		,865				
Social wellbeing	ewb_11	3,08	,66088	,771				,943	34,332
	ewb_12	3,10	,64334	,714					
	ewb_13	3,09	,61888	,843					
	ewb_14	3,06	,60735	,782					
	ewb_15	3,09	,66882	,837					
	ewb_16	3,08	,64112	,745					
	ewb_17	3,10	,65326	,816					
	ewb_18	3,08	,65515	,786					
	ewb_19	3,06	,65816	,737					
Subjective wellbeing	ewb_20	3,62	1,20205				,864	,805	7,734
	ewb_21	4,37	,90172				,687		
	ewb_22	4,00	1,02697				,673		
	ewb_23	3,79	1,00621				,885		
Workplace wellbeing	ewb_24	2,97	,62064			,655		,939	4,102
	ewb_25	2,87	,59708			,679			
	ewb_26	2,92	,55022			,676			
	ewb_27	2,87	,61824			,726			
	ewb_28	2,90	,60840			,731			
	ewb_29	2,89	,59125			,608			
	ewb_30	2,93	,59666			,676			
	ewb_31	2,91	,59334			,651			
Total scale								,815	

Kaiser-Meyer-Olkin (KMO): 0,913; Bartlett Test: 0,000; Total variance explained: 68,697

According to Table 3, KMO (0.913) and Bartlett test (lower than 0.001) strongly supported the applicability of factor analysis. Results showed that the scale consists of four sub-dimensions and is reliable (reliability coefficient 0.815). The mean values for all items ranged between 2,87 and 4,37, indicating that participants generally provided responses close to the mid-point to upper end of the scale, suggesting a more positive perception of well-being.



CMIN/df:2,220; AGFI:,859; GFI:,907; NFI:,902; CFI:,943; IFI:,944; RMSEA:,063

Figure 5. Employee Well-being / Confirmatory Factor Analysis

In the confirmatory factor analysis applied to the "Employee Well-being" scale, items "ewb_2", "ewb_7", "ewb_21" and "ewb_22" were removed from the analysis as their factor loadings were below 0.60 and negatively affected the model fit. As a result, the factor loadings in the model ranged between 0.73 and 0.94 (Figure 5). To improve the goodness-of-fit values, covariances were established between some latent variables. Regarding the overall model fit, the CMIN/df (2.220) value was below 5, indicating an acceptable model fit. Among the absolute fit indices, AGFI (0.859) and GFI (0.907) suggest a good overall model fit, although AGFI is at a borderline acceptable level. The indices NFI (0.902), CFI (0.943), and IFI (0.944) are all above 0.90, indicating a strong model fit. Additionally, the RMSEA (0.063) value was below 0.08, further supporting the acceptability of the model fit. All these findings indicate that the "Employee Well-being" scale demonstrates a good level of fit with the data and confirms the existence of four sub-dimensions.

Table 4. Organizational Commitment / Descriptive Statistics, Exploratory Factor and Reliability Analysis Results

Name	Items	Average (X)	Std. deviation	Factor weights 1	2	3	Reliability (α)	Variance explained (%)
Affective Commitment	oc_1	2,89	,59125		,698		,923	9,583
	oc_2	2,93	,59666		,650			
	oc_3	2,91	,59334		,808			
	oc_4	2,91	,60408		,760			
	oc_5	2,87	,57513		,574			
	oc_6	2,92	,64267		,728			

Continuance Commitment	oc_7	2,77	,63725		,618	,890	5,681
	oc_8	2,85	,65938		,776		
	oc_9	2,76	,62987		,726		
	oc_10	2,84	,63300		,683		
	oc_11	2,87	,67779		,732		
	oc_12	2,85	,61544		,691		
Normative Commitment	oc_13	3,08	,66489	,732		,965	51,050
	oc_14	3,13	,63232	,791			
	oc_15	3,03	,60459	,643			
	oc_16	3,09	,66882	,691			
	oc_17	3,02	,62064	,764			
		3,08	,65108	,808			
Total scale						,953	

Kaiser-Meyer-Olkin (KMO): 0,945; Bartlett Test: 0,000; Total variance explained: 66,314

According to Table 4, KMO (0.945) and Bartlett test (lower than 0.001) strongly supported the applicability of factor analysis. Results indicated that the scale consists of three sub-dimensions and is highly reliable (reliability coefficient 0.953). The mean values for all items ranged between 2,77 and 3,13, indicating that participants generally provided responses around the mid-point of the scale, suggesting a neutral stance on organizational commitment.

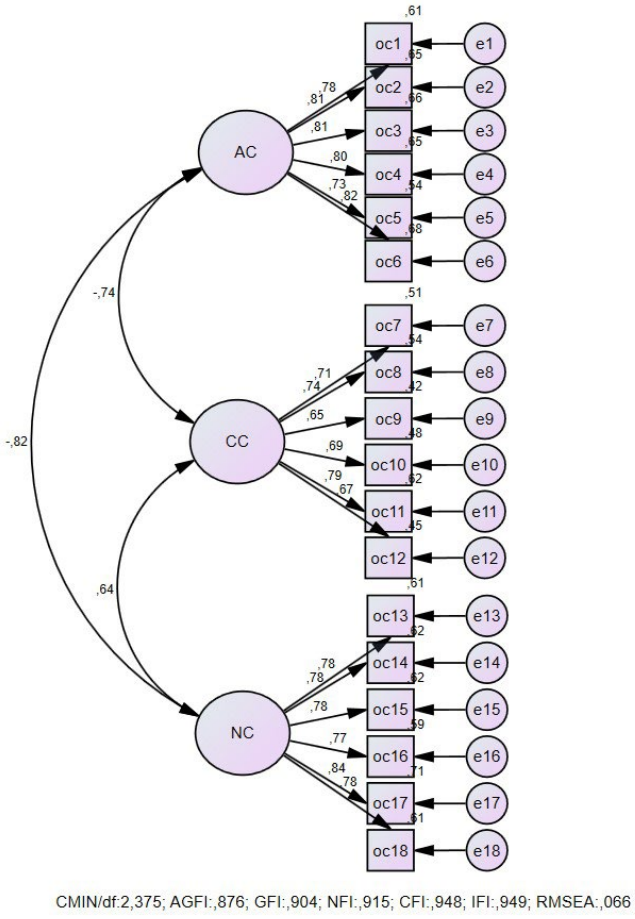


Figure 6. Organizational Commitment / Confirmatory Factor Analysis

The factor loadings ranged between 0.65 and 0.84, indicating a generally high level (Figure 6). Regarding the overall model fit, the CMIN/df (2.375) value was below 5, indicating an acceptable model fit. Among the absolute fit indices, AGFI (0.876) and GFI (0.904) suggest a good overall model fit, although AGFI is at a borderline acceptable level. The indices NFI (0.915), CFI (0.948) and IFI (0.949) all exceed 0.90, indicating a strong model fit. Additionally, the RMSEA (0.066) value was below 0.08, further supporting the acceptability of the model fit. All these findings indicate that the "Organizational Commitment" scale demonstrates a good level of fit with the data and confirms the existence of three sub-dimensions.

4.2. Relationship Analyses Between the Scales

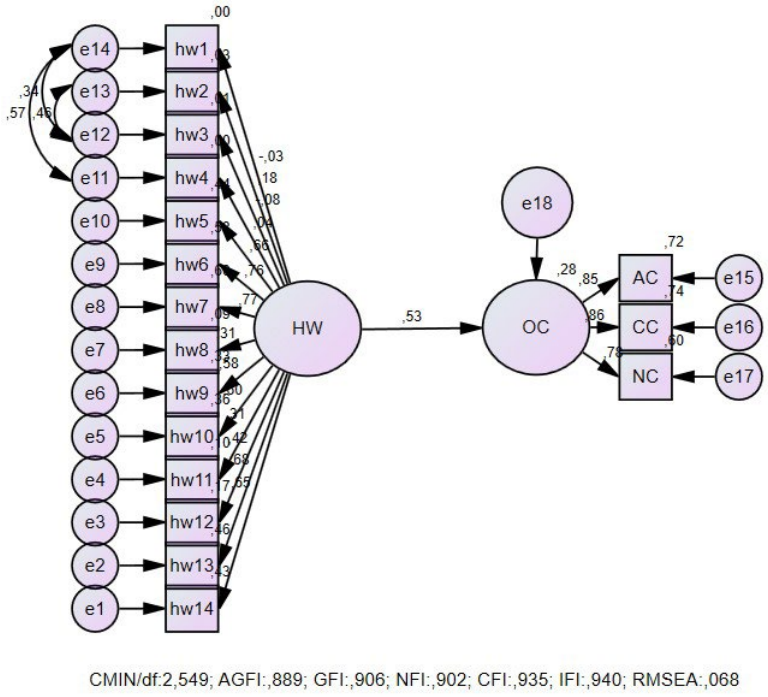


Figure 7. The Effect of Hybrid Work Environments on Organizational Commitment / Structural Equation Model (SEM)

As seen in Figure 7, covariances were determined between some latent variables to improve the goodness of fit values. When examining the model fit indices, the CMIN/df (2.549) value was below 5, indicating an acceptable model fit. Among the absolute fit indices, AGFI (0.889) and GFI (0.906) suggest a good overall model fit. The indices NFI (0.902), CFI (0.935) and IFI (0.940) all exceed 0.90, indicating a strong model fit. Additionally, the RMSEA (0.068) value was below 0.08, further supporting the acceptability of the model fit. Based on all these values, it can be concluded that the structural model falls within acceptable limits, confirming the validity of the model.

When examining the relationship between hybrid work environment and organizational commitment, the standardized regression coefficient ($\beta = 0.529$, $p < 0.001$) was found to be positive and statistically significant. This positive relationship indicates that as the hybrid work increases, the level of organizational commitment also increases. Evaluating the explanatory power of the model, it was observed that the independent latent variable, hybrid work environment explains 60.2% of the variance in the dependent latent variable organizational commitment ($R^2 = 0.602$). All these findings suggest that the hybrid work environment plays a significant role in enhancing organizational commitment levels.

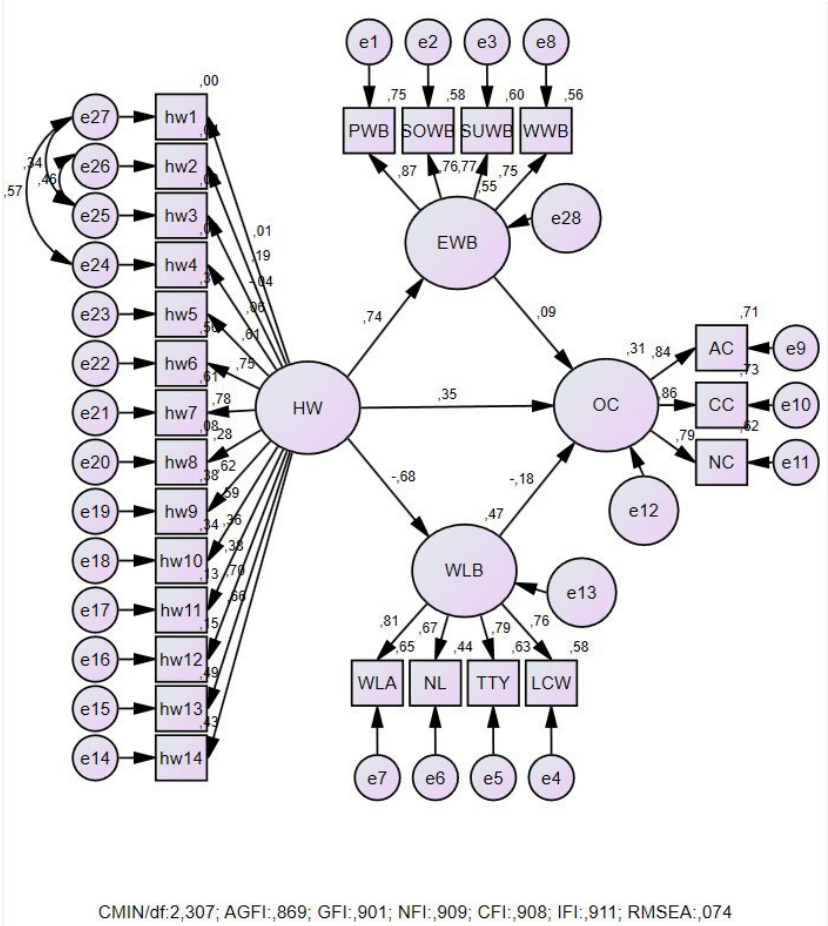


Figure 8. Employee Well-being, Work-Life Balance, Hybrid Work Environments and Organizational Commitment Scales / Structural Equation Model (SEM) and Model Fit Criteria

Path analysis results and goodness-of-fit values for hybrid work environment, organizational commitment, employee well-being and work-life balance are presented above Figure 8. To improve the goodness-of-fit values, covariances were established between some latent variables. When examining the model fit indices, the CMIN/df (2.307) value was below 5, indicating an acceptable model fit. Among the absolute fit indices, AGFI (0.869) and GFI (0.901) suggest a good overall model fit, although AGFI is at a borderline acceptable level. The indices NFI (0.909), CFI (0.908), and IFI (0.911) all exceed 0.90, indicating a strong model fit. Additionally, the RMSEA (0.074) value was below 0.08, further supporting the acceptability of the model fit. Based on all these values, it can be concluded that the structural model falls within acceptable limits, confirming the validity of the model. Structural equation model results are presented in Table 5:

Table 5. Model Pathways

Dependent		Independent	St. β	St. Er	R^2	p	Hypotheses	Hypotheses results
EWB	←	HW	,741	,179	,549	***	H3	Accepted
WLB	←	HW	-,682	,106	,466	***	H1	Accepted
OC	←	EWB	,089	,120	,311	,021	H4	Accepted
OC	←	WLB	-,181	,196		,042	H2	Accepted
OC	←	HW	,350	,261		,048	H5	Accepted

***p<0,001

The effect of the Hybrid Work Environment (HW) on Employee Well-being (EWB) ($\beta = 0.741$, $p < 0.001$) was positive, strong and statistically significant (therefore H3 is accepted). This result indicates that employees' well-being significantly improves in a hybrid work environment. 54.9% of the variance in Employee Well-being is explained by the Hybrid Work Environment ($R^2 = 0.549$). This finding suggests that hybrid work substantially supports employee well-being.

On the other hand, the effect of the Hybrid Work Environment (HW) on Work-Life Balance (WLB) is negative, strong and statistically significant ($\beta = -0.682$, $p < 0.001$) (therefore H1 is accepted). 46.6% of the variance in Work-Life Balance is explained by the Hybrid Work Environment ($R^2 = 0.466$). This indicates that the hybrid work environment may have a negative impact on work-life balance, making it difficult for employees to establish clear boundaries between their work and personal lives.

When examining the effects on Organizational Commitment (OC), the impact of Employee Well-being on Organizational Commitment was positive, statistically significant, but relatively weak ($\beta = 0.089$, $p = 0.021$). The relationship between Work-Life Balance and Organizational Commitment was negative and significant ($\beta = -0.181$, $p = 0.042$). As work-life balance improves, employees' commitment to their organization may decrease. Therefore, H4 and H2 were accepted.

The direct effect of the Hybrid Work Environment on Organizational Commitment is positive, statistically significant, but moderate in strength ($\beta = 0.350$, $p = 0.048$) (therefore H5 is accepted). This result indicates that while the hybrid work environment can enhance employees' commitment, its effect is limited. The indirect and mediating effects of the Hybrid Work Environment on Organizational Commitment are presented in the following Table 6:

Table 6. Mediation Analysis Results

	St. Indirect effect (β)	Bootstrap (Lower Bounds/Upper Bounds) %95 Confidence Interval	Hypotheses	Hypotheses results
OC ← EWB ← HW	,741	,649/, 846	H7	Accepted
OC ← WLB ← HW	-,682	-,799/-,594	H6	Accepted

Note: Bootstrap sample of 5,000

The mediation analysis conducted in this study aligns with the four-step approach proposed by Baron and Kenny (1986), which remains a foundational method in testing indirect effects between variables. According to their framework, a variable is considered a mediator if the following conditions are met: (1) the independent variable significantly affects the dependent variable; (2) the independent variable significantly affects the mediator; (3) the mediator significantly affects the dependent variable while controlling for the independent variable; and (4) the effect of the independent variable on the dependent variable is reduced when the mediator is included in the model. In this research, the hybrid work environment was shown to significantly influence both mediators, employee well-being and work-life balance, as well as the dependent variable, organizational commitment. Furthermore, when the mediators were included in the model both mediators had significant indirect effects, as confirmed by bootstrapping analysis. These results support the presence of partial mediation and validate the theoretical assumptions grounded in Baron and Kenny's approach.

In fact, the above Table 6 presents indirect effects (β) of Hybrid Work (HW) on Organizational Commitment (OC) through two mediating variables: Employee Well-being (EWB) and Work-Life Balance (WLB). The results indicate that Hybrid Work Environment (HW) has a significant indirect effect on Organizational Commitment (OC) through Employee Well-being (EWB). The standardized indirect effect ($\beta = 0.741$) demonstrates a strong positive impact, suggesting that employees who experience improved well-being in a hybrid work environment are more likely to feel committed to their organization. The bootstrap confidence interval (95% CI: [0.649, 0.846]) does not include zero, confirming the statistical significance of this indirect effect. Therefore, H7 was accepted, supporting the idea that hybrid work positively influences organizational commitment by enhancing employee well-being.

On the other hand, the analysis also revealed a significant negative indirect effect of Hybrid Work Environment (HW) on Organizational Commitment through Work-Life Balance (WLB). The standardized indirect effect ($\beta = -0.682$) indicated that hybrid work negatively impacts work-life balance, which in turn reduces employees' commitment to their organization. The bootstrap confidence interval (95% CI: [-0.799, -0.594]) does not include zero, confirming that this indirect effect is statistically significant. As a result, H6 was accepted, indicating that the hybrid work environment weakens work-life balance, which subsequently leads to a decline in organizational commitment.

These findings highlight the dual nature of hybrid work, showing that while it enhances employee well-being and contributes positively to commitment, it negatively affects work-life balance, which in turn reduces organizational commitment. Organizations should carefully evaluate their hybrid work policies, ensuring that they optimize employee well-being while minimizing disruptions to work-life balance to sustain organizational commitment.

4.3. Relationship Analyses Between the Sub-Dimensions

Table 7. Regression Analysis Results

Dependent		Independent	β	p
Affective Commitment	←	Hybrid Work	,369	< ,001
Continuance Commitment	←	Hybrid Work	,377	< ,001
Normative Commitment	←	Hybrid Work	,493	< ,001
Psychological Well-being	←	Hybrid Work	,622	< ,001
Social Well-being	←	Hybrid Work	,485	< ,001
Subjective Well-being	←	Hybrid Work	,522	< ,001
Workplace Well-being	←	Hybrid Work	,538	< ,001
Work-life Adjustment	←	Hybrid Work	-,480	< ,001
Neglecting Life	←	Hybrid Work	-,327	< ,001
Taking Time for Yourself	←	Hybrid Work	-,470	< ,001
Life Consists of Work	←	Hybrid Work	-,484	< ,001
Affective Commitment	←	Workplace Well-being	,317	,003
Continuance Commitment	←	Workplace Well-being	,335	,002
Normative Commitment	←	Social Well-being	,389	< ,001
Continuance Commitment	←	Life Consists of Work	-,221	,039

Regression analysis results show that the hybrid working model has statistically significant effects on all sub-dimensions (Table 7). These results mean that hybrid working increases the moral responsibility or obligation of employees towards the organization and strengthens the emotional commitment and the perception of the obligation to continue working. Based on Table 7, it can also be said that hybrid working may lead to blurring of boundaries and work dominating private life.

5. Discussion, Model Proposal and Conclusion

The results demonstrate that the hybrid work environment has a strong, positive effect on well-being ($\beta = 0.741$, $p < 0.001$). This finding supports previous research (Mortensen & Haas, 2021; Sun et al., 2025) and aligns with the Job Demands-Resources (JD-R) Model (Bakker & Demerouti, 2007). This positive effect, according to literature, depends on the level of resources provided by organizations (da Silva et al., 2022). However, negative impact of hybrid work on work-life balance was also found in this study ($\beta = -0.682$, $p < 0.001$). This showed that rather than reducing work-life conflict, hybrid work, in Türkiye setting, worsen the work-life balance of the female employees. This finding is consistent with Work-Family Conflict Theory (Greenhaus & Beutell, 1985), which suggests that role conflicts between work and personal life negatively impact professional engagement and well-being. Prior research also identifies the "always-on" culture as a major downside of hybrid work, as employees experience heightened expectations for availability, leading to increased stress and difficulty maintaining personal boundaries (Selvaraju, 2024). Supporting this, Yosunkaya (2023) found that while a significant proportion of hybrid employees expressed satisfaction with this work model, 66% reported concerns about the dissolution of clear working hours, reinforcing the notion that work-life balance remains a major area of concern. This aligns with observations in collectivist and high-context cultures, such as Türkiye, where strong family ties and social expectations intensify the challenges of maintaining work-life balance. The cultural emphasis on caregiving roles for women may further exacerbate these difficulties, suggesting that hybrid work models require careful adaptation to fit the socio-cultural fabric of such societies.

This study further reveals that while employee well-being positively influences organizational commitment (β = 0.089, p = 0.021), this relationship is relatively weak. This suggests that while well-being contributes to commitment, it is not the primary driver since commitment may be influenced by other factors such as job security and career progression (Saritha & Akthar, 2024). Nevertheless, the moderate effect of hybrid work on organizational commitment (β = 0.350, p = 0.048) supports prior research indicating that flexible work arrangements can enhance commitment when employees perceive them as beneficial for professionals (Vidya Sri & Vasantha, 2024). This pattern aligns closely with findings reported in Western contexts, where hybrid work often strengthens organizational commitment due to increased autonomy and work flexibility, which are highly valued in individualistic and low power distance cultures. However, the relatively weak influence of well-being on commitment observed in this study may reflect the specific cultural characteristics of Türkiye, where hierarchical relationships, job security, and career progression are more central to organizational commitment. In high power distance cultures like Türkiye, employees may prioritize stability and managerial recognition over personal well-being as primary drivers of commitment, thus explaining the limited role well-being plays in fostering commitment in this context.

An unexpected yet significant result was found as the negative relationship between work-life balance and organizational commitment (β = -0.181, p = 0.042). This contradicts much of the existing literature, which generally suggests that a better work-life balance raises higher engagement and retention. A possible explanation is that as employees achieve a better work-life balance, they may feel less dependent on their organizations and thus less committed (Marozva & Pelser, 2025). This shift in career priorities could lead female employees who achieve sustainable work-life balance to prioritize personal fulfillment over long-term loyalty to an organization (Bhargavi, 2025). Another plausible interpretation, as suggested by Marozva & Pelser (2025), is that greater autonomy in hybrid settings may reduce employees' sense of belonging, potentially weakening their long-term organizational commitment. Similar patterns have been observed in other Asian cultural contexts, further emphasizing the culturally contingent nature of hybrid work outcomes. For example, in India, recent research has highlighted both the benefits and challenges associated with hybrid work arrangements. Vidya Sri and Vasantha (2024) found that hybrid and remote working models positively influence employees' work-life balance by providing greater flexibility. However, the same study revealed that these models generate uncertainty regarding career advancement and organizational commitment, largely due to the cultural importance placed on hierarchical visibility and face-to-face interactions within the Indian workplace. Supporting this view, Rani and Rakesh (2024) demonstrated that while hybrid work enhances the well-being of female employees in India, concerns surrounding reduced leadership visibility and limited career progression persist, reflecting the influence of gender roles and organizational hierarchies in high power distance cultures. In China, similar findings have emerged. Qi et al. (2021) reported that hybrid work environments strengthen organizational commitment when clear communication and managerial support are present, which aligns with China's hierarchical cultural structure. However, in the absence of these support systems, employees experience increased stress due to heightened uncertainty, a common characteristic of high uncertainty avoidance cultures. Moreover, Liu and Sutunyarak (2025) highlighted that while flexible working schedules improve work-life balance among Chinese employees, the social isolation resulting from reduced physical interaction negatively affects psychological well-being, illustrating the importance of collective harmony in Chinese society. A comparable situation exists in Indonesia, where cultural values rooted in collectivism influence the reception of hybrid work models. Irawanto et al. (2021) found that while flexible work arrangements contribute positively to work-life balance, the lack of regular in-person interactions undermines organizational commitment, as strong group cohesion and face-to-face engagement remain central to Indonesian workplace culture. Furthermore, Irawanto et al. (2021) reported that hybrid work presents specific challenges for female employees in Indonesia, particularly in managing family responsibilities alongside professional duties, leading to difficulties in maintaining work-life balance.

These findings collectively emphasize the dual nature of hybrid work: while it enhances employee well-being and contributes positively to organizational commitment, it simultaneously disrupts work-life balance, which in turn can diminish commitment levels. This underscores the importance of strategic hybrid work policies that not only promote well-being but also actively prevent work-life imbalances from eroding organizational loyalty. Organizations must establish clear boundaries, develop leadership visibility programs, and provide structured support mechanisms to ensure that hybrid work serves as an enabler rather than a disruptor of long-term workforce engagement. Findings also clearly demonstrated that in different cultures, hybrid work may have different effects. In collectivist and high-power distance cultures like Türkiye, organizational commitment often stems from hierarchical relationships, social obligations, and economic security rather than solely from personal well-being or work-life balance. These insights reinforce the argument that hybrid work models should not be universally applied wit-

hout consideration of cultural contexts. Instead, they should be adapted to align with the social expectations, organizational structures, and cultural norms of the regions in which they are implemented.

In addition to considering cultural perspective, job resources should also be improved. In the literature it was stated that hybrid work is a different working model than remote work, and since employees work at home and sometimes in the office, they mostly have no special work area where they can focus on their work-related responsibilities in their homes (Gorjifard & Crawford, 2021). This situation reveals that women, particularly those who have motherhood or home-related responsibilities, often find themselves managing their work-related responsibilities concurrently with home-related tasks. This situation can reduce both the focus and motivation of women and their desire to continue working. Therefore, it is important for organizations to support their employees. This includes providing ongoing training on effective work from home practices, raising awareness of the potential challenges of these arrangements, and offering clear guidance on how to address the problems they may encounter in this working system through practical solutions. In this respect, it can be argued that if organizations increase supportive job resources such as training programs, more ergonomic work areas for women in the homes or better technological opportunities and make these resources accessible to female employees, they can create a female employee base with higher commitment.

In fact, based on the results it can be said that conflict which occurs through work-family balance can be mitigated by increasing job resources and considering cultural differences. This can be used as a formula for achieving organizational commitment among the women who work in hybrid working system. Based on this, following model (Figure 9) that is build on the culture, job demand and job resources can be offered:

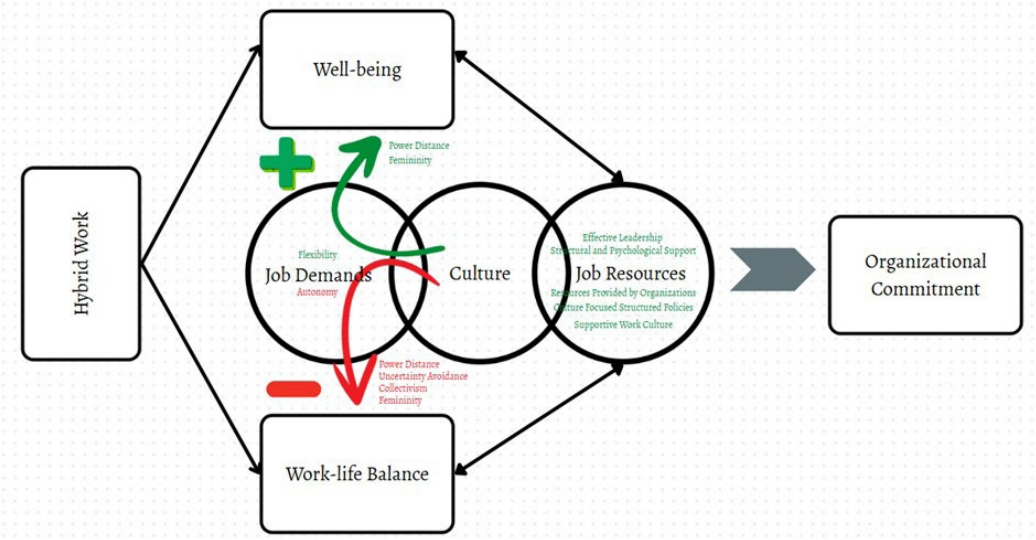


Figure 9. Conceptual Model Proposal

The proposed conceptual model integrates hybrid work arrangements with the Job Demands-Resources (JD-R) framework and embeds Hofstede's cultural dimensions as key moderators shaping the perception and outcomes of these work structures. While the JD-R model suggests that job demands and job resources directly affect employee well-being, work-life balance, and ultimately organizational commitment, this framework posits that these relationships are significantly influenced by cultural context. In fact, when considering western culture, autonomy and flexibility are generally perceived as positive job resources. It is because, employees of western culture are familiar with making independent decisions and managing their own schedules due to their culture's features such as low power distance, high individualism, and low uncertainty avoidance. Nevertheless, in eastern cultures, these same elements may be seen as job demands rather than resources. In cultures like Türkiye, autonomy possibly will no longer function as a resource but rather it will be understood as a demand. It is because, in high-power distance cultures employees are more comfortable receiving direct instructions from their superiors and thus, giving them a space for authorization in their decisions understood as increased demand. In fact, when autonomy is assigned to the employees without structured guidance, it can create ambiguity and stress. Therefore, flexibility in hybrid work settings can be perceived as an additional source of uncertainty rather than a benefit. Similarly, in collectivist cultures like Türkiye, face-to-face interactions, group organization, and shared decision-making are essential parts of working. Hybrid work reduces physical presence and increases remote interactions. In fact, it weakens social connections, decreases trust, and disrupts team dynamics. As a result, employees may experience decreased well-being and damaged work-life balance, specifically when organizational support systems are in-

sufficient to close these gaps. Nevertheless, cultural factors can also lessen these negative effects under certain conditions. For instance, the femininity dimension can enhance the perception of job resources, even in more hierarchical cultures. In cultures where femininity is stronger, supportive leadership, structured policies, and psychological safety can counterbalance the stress induced by high demands while increasing the well-being and organizational commitment.

This framework contributes to the literature by demonstrating that cultural dimensions actively moderate the effects of hybrid work, leading to varied psychological and organizational outcomes across different regions. Such insights emphasize the importance of adapting hybrid work policies to cultural contexts to ensure that intended benefits, such as improved well-being, work-life balance, and organizational commitment, are realized. This is also important from the perspective of sustainability as from a sustainability perspective, it is not enough for women to simply enter the workforce through hybrid work arrangements. Indeed, what truly matters and what truly provides a positive impact on sustainable development is ensuring their long-term engagement in professional life. A strong sense of commitment supports career continuity, reinforces professional identity, and lowers the likelihood of employees leaving their positions, particularly among women.

Despite its contributions, the study has certain limitations. The most significant limitation relates to the sample selection process. Due to the lack of official records identifying the number of hybrid workers in Türkiye, the study relied on earlier studies' sampling process which can limit the generalizability of the results. Efforts were made to mitigate this by reaching as many participants as possible, but future research should aim to employ more robust sampling strategies, including representative samples across various sectors and industries. For future research, comparative studies across different cultural contexts are recommended to further explore how cultural values influence the perception and outcomes of hybrid work.

Declaration:

Ethics committee approval for the research was obtained by the Istanbul Kent University, Social and Human Sciences Research Ethics Committee with the decision dated 03.01.2025 and meeting number 2025/01.

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Research Article

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The Effect of Sport Recreation Participants'Body Image Perceptions on Their Recreation Anxiety: The Role of Gender[1]

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Abstract

Recreation is the utilisation of individuals' free time outside working hours. Recreation anxiety refers to the stress and anxiety experienced by individuals during participation in these leisure time activities. Recreation anxiety is affected by many factors and has an effect on individuals' well-being. This study aims to examine the relationship between individuals' body image perception and recreation anxiety and the regulatory role of gender in this relationship. For this purpose, analyses were carried out with the data obtained from 295 volunteer participants, 148 of whom were female and 147 of whom were male. Recreation anxiety was assessed with the Recreation Anxiety Scale and body image perception was assessed with the Body Image Scale. As a result of the analysis, it was seen that increasing body image anxiety showed a significant relationship with increasing recreation anxiety. It was found that the regulatory role of gender in the relationship between body image anxiety and recreation anxiety was not significant. In especially sportive recreation activities, the negative evaluation of body image may be an important cause of anxiety due to performance, social comparisons and aesthetic expectations. It is thought that this situation may cause a decrease in intrinsic motivation, an increase in recreation anxiety and thus a decrease in participation in sportive activities. Although women feel pressure towards body image due to expectations of being thin and aesthetic, it is seen that men may also feel anxiety towards body image due to social expectations of being muscular and strong. Therefore, women and men may feel similar levels of body image anxiety, albeit with different expectations. The relationship between recreation anxiety and body image perception is complex and multifaceted. Therefore, this relationship needs to be explained by different factors and cross-cultural studies are needed.

Keywords: Sport Recreation, Recreation Anxiety, Body Image, Gender, Psychology Behaviour.

JEL Codes: I10, I12, I83

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1. Introduction

Recreation is the use of leisure time outside of work and other responsibilities (Gündoğdu, 2018). This leisure time experience is often described as positive experiences such as socialising, excitement, enjoyment and relaxation. Indeed, studies have revealed that participation in recreational activities has a positive effect on individuals' physical, social, and psychological well-being (Bélair et al., 2018). However, these experiences can also turn into negative experiences such as ambition, anger, and anxiety. It has been observed that individuals sometimes experience anxiety when participating in these activities. The anxiety and stress that individuals experience when participating in leisure time activities is defined as recreation anxiety (Karakaya & Yıldız, 2021). The concept of recreation anxiety is a relatively new concept and has not been sufficiently addressed. Studies often focus on the relationship between recreation and anxiety rather than recreation anxiety specifically. In particular, performance anxiety experienced by individuals who engage in sports (Weinberg & Gould, 2020) and the risk of injury in sports that require intense physical effort (Gould & Krane, 2019) have been found to be associated with high levels of anxiety. Furthermore, in group recreational activities, individuals' concerns about being evaluated may also be related to increased anxiety (Russell, 2021). All of these factors can contribute to increased recreation anxiety in individuals who participate in sports, thereby limiting their participation in recreational activities (Scanlan et al., 2020), increasing their stress and burnout levels (Smith, 2019), and being associated with a decrease in self-esteem (Deci & Ryan, 2020). This research examines the relationship between body image perception and recreation anxiety in individuals who engage in sports. The concept of body image perception refers to individuals' perceptions of their own physical appearance and their evaluations of that appearance (Cash & Smolak, 2011). The perception of body image, especially among individuals who engage in sports and recreational activities, can be a significant cause of anxiety due to performance, social comparisons, and aesthetic expectations. Studies often evaluate the relationship between body image perception and the level of participation in recreational activities. Indeed, a study reveals that body dissatisfaction causes social physical anxiety, which leads to avoidance of sports activities (Atalay & Gençöz, 2008). Another meta-analysis study shows that increased body image satisfaction is associated with increased participation in sports activities (Campbell & Hausenblas, 2009). These findings suggest that body image perception may cause an increase in recreation anxiety and thus limit participation in these activities. Therefore, the main question of this research is whether there is a relationship between individuals' body image perception and recreation anxiety.

Another question addressed in the study is whether there is a significant relationship between body image perception and recreation anxiety, and whether this relationship is moderated by gender. The relationship between body image perception and gender has been frequently examined in the literature, but the findings obtained from the studies are not homogeneous. Due to different samples, cultural contexts, and measurement methods, some studies report that women (Grogan, 2016; Sabiston & Crocker, 2008) have a more negative body image than men, while other studies report no significant gender difference (Demarest & Allen, 2000; Ricciardelli & McCabe, 2004). While both genders share the pressure to have an ideal body, they may experience this pressure differently. Social gender roles and associated norms and expectations can cause different concerns in women and men. The roles that society assigns to genders often emphasise that women should be thin and aesthetic, while men should have a more muscular and powerful body image. Thus, while both women and men feel pressure to have an ideal body, women feel pressure to have a slim body, while men feel pressure to have a muscular body. This pressure can negatively affect body image perception, which may be related to an increase in recreation anxiety. Because the belief that individuals do not have an ideal body, especially in sports activities, can lead to expectations of failure and anxiety about looking worse than others when comparing oneself to others in group activities.

In summary, with the diversity of findings presented by recreation studies, the concept of recreation anxiety is relatively new and needs further explanation. Studies often provide explanations regarding the relationship between participation in recreational activities and anxiety. This study specifically addresses recreation anxiety, which is anxiety related to recreational activities. It is known that recreation anxiety restricts participation in recreational activities and therefore has a negative effect on mental well-being. Therefore, there is a need for further explanation of recreation anxiety and related factors in order to develop possible solutions and create programmes aimed at reducing anxiety. This study focuses on the relationship between individuals' body image perception and recreation anxiety. In addition, the study examines the moderating role of gender in the relationship between body image perception and recreation anxiety. That is, it examines whether the possible relationship between body image and recreation anxiety is higher or lower in different gender groups. In this respect, in addition to explaining recreation anxiety, the research aims to offer an explanation for both genders as an alternative to the findings of studies that focus mainly on women.

The main questions of the study and the hypotheses developed based on these questions are listed below.

Q1: Is there a statistically significant relationship between body image perception and recreation anxiety?

Q2: Does gender have a moderating role in the relationship between body image perception and recreation anxiety?

$H1_0$: There is no statistically significant relationship between body image perception and recreation anxiety.

$H1_1$: There is a statistically significant relationship between body image perception and recreation anxiety.

$H2_0$: Gender does not play a statistically significant moderating role in the relationship between body image perception and recreation anxiety.

$H2_1$: Gender plays a statistically significant moderating role in the relationship between body image perception and recreation anxiety.

2. Method

Ethical approval for the study was obtained from Süleyman Demirel University Ethics Committee on 18/10/2024. The number of Ethics Committee approval is E.865351.

2.1. Sampling

The sample of the research was aimed to consist of individuals participating in active sports recreation activities. The sample size was determined according to the analyses to be applied in the research, and the highest sample number suitable for these analyses was taken into consideration. Using the G Power 3.1.9.4. programme, it was determined that the sample size should be 119 (F test, fixed model R2 increase, a priori, effect size f2: 0.15, alpha error probability: 0.05, power: 0.95, number of estimators tested: 3, total number of estimators: 3). In addition, it was decided to apply path analysis to the structural equation modelling in the research. Path analysis consists of three variables and a total of three paths. Siddiqui (2013) reported in his compilation research, which he conducted with reference to many sources, that a sample size of 200-400 is necessary for SEM. The researcher stated that a minimum of 100, preferably 200, samples are required for SEM. Jackson (2001) noted that the sample size should be between 200 and 400. Hu and Bentler (1999) recommended a sample size of 250 or more. Çerezci (2010) stated that the sample size could be around 300, and that fit values stabilise after this size. Considering all this information together, and taking into account missing data, the target was set to reach approximately 300 participants.

The research data was collected using an online survey and snowball sampling. Specifically, the initial sharing was conducted with university students studying at the Faculty of Sports Sciences at Süleyman Demirel University, and then it was requested to be shared in groups, including members of sports clubs. Before participating in the research, individuals were informed in detail about the research and ethical rules. Data was collected from 306 participants who voluntarily agreed to participate in the research. After the data was collected, the data set was checked. The condition for participation in the research was that individuals were currently actively participating in recreational sports activities. In this context, data from three individuals who are not currently actively participating in these activities but who indicated that they had participated in the past were excluded from the data set. Additionally, data from eight participants were excluded from the data set due to incomplete forms. Ultimately, the study continued with data from 295 participants after the data set was checked.

The inclusion criteria of the study were determined as being over the age of 18, completing the inventories completely and being currently engaged in sportive recreation activities. Exclusion criteria were determined as being younger than 18 years of age and not currently participating in sportive recreation activities. Considering the inclusion and exclusion criteria, 295 participants participated in the study. Of these participants, 50.2% (n=148) were female and 49.8% (n=147) were male. The average age of the participants was 34.49 years (SD=7.903), the youngest participant was 19 years old and the oldest participant was 55 years old. Again, 1% (n=3) of the participants were high school graduates, 39.7% (n=117) were associate/undergraduate graduates and 59.3% (n=175) were postgraduate graduates. The socio-demographic characteristics of the participants are summarized in Table 1.

Table 1. Socio-Demographic Information of Participants

Variables		N	%
Gender	Female	148	50,2
	Male	147	49,8
	Total	**295**	**100,0**

Age	18-25	30	10,2
	25-35	118	40,0
	35-45	118	40,0
	45 ve Over	29	9,9
	Total	**295**	**100,0**
Education Status	İlköğretim	0	0,0
	Lise	3	1,0
	Önlisans/Lisans	117	39,7
	Lisansüstü	175	59,3
	Toplam	**295**	**100,0**
Income Level	Lower	20	6,8
	Lower-Middle	41	13,9
	Middle	146	49,5
	Upper-Middle	88	29,8
	High	0	0,0
	Total	**295**	**100,0**
Regular Sports	Yes	295	100,0
	No	0	0,0
	Total	**295**	**100,0**
Frequency of Sports	1 Day a Week	75	25,4
	2-3 Day a Week	150	50,8
	4-5 Day a Week	47	15,9
	Every Day of the Week	23	7,8
	Total	**295**	**100,0**

2.2. Research Method and Technique

The research was quantitatively designed and carried out with the similar subjects sampling method (survey). The data in the study were obtained online through written questioning (questionnaire) technique.

2.3. Research Purpose and Model

In this study, it is aimed to determine the regulatory role of gender in the relationship between recreation anxiety and body image perceptions of people engaged in sportive recreation activities. The research model created in this direction is given in Figure 1.

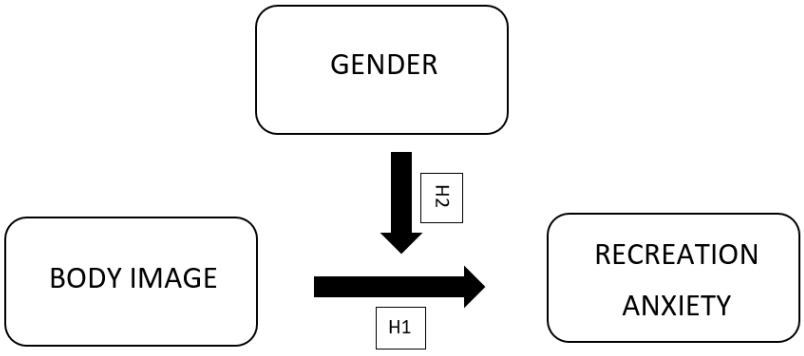

Figure 1. Research Model

2.4. Data Collection Tools

2.4.1. Socio-demographic information form

Socio-demographic information form includes questions prepared by the researchers to collect information about the socio-demographic characteristics of the participants. The form also includes questions such as gender, age, education level, socio-economic status, organized sports activities, frequency of doing sports, finding their body beautiful, finding others' bodies beautiful and comparing their bodies with others.

2.4.2. Recreation anxiety scale

It was developed by Orhun et al. (2024) The scale, which was developed with 113 items, was finalized with 25 items. The scale is in 5-point Likert type. As the scores obtained from the scale increase, it is thought that recreation anxiety also increases. The scale consists of six sub-dimensions. These are self-efficacy and social anxiety, physical symptoms, economic anxiety, safety anxiety, responsibility anxiety, and expectation anxiety. In the study, the Cronbach Alpha coefficients of the subscales were found to be .89, .74, .86, .86, .77, .88, and .83, respectively. The overall scale was found to be .94. The factor loads of the items belonging to the subscales were found to be between 0.567 and 0.766 in the self-efficacy and social anxiety subscale, between 0.610 and 0.816 in the physical symptoms subscale, between 0.518 and 0.790 in the economic anxiety subscale, between 0.808 and 0.727 in the safety anxiety subscale, between 0.838 and 0.489 in the responsibility anxiety subscale, and between 0.844 and 0.517 in the expectation anxiety subscale. The total variance of all subscales is 68.72%. Finally, the confirmatory factor analysis data of the scale were statistically appropriate (X2/df= 2.24; RMSEA= 0.072; GFI= 0.91; CFI= 0.92; SRMR= 0.06).

2.4.3. Body image scale

The scale developed by Saylan and Soyyiğit (2022) was formed in a pool of 30 items. The final version of the scale has 21 items and is a 5-point Likert scale. It is thought that as the scores obtained from the scale increase, negative body image increases. The scale consists of four subscales. These are; negative perception of the body, evaluation sensitivity, positive perception of the body and body change. While Cronbach's Alpha for the total scale was 0.92, the Cronbach's Alpha values of the subscales ranged between 0.79 and 0.88. Again, the factor loadings of the items in the overall scale ranged between 0.49 and 0.98, while the total variance explained was 62.0%. Finally, the confirmatory factor analysis data of the scale are statistically appropriate (X2/df= 1.72; RMSEA= 0.061; GFI= 0.87; CFI= 0.95; SRMR= 0.063).

2.4.4. Process

A questionnaire form including Demographic Information Form, Recreation Anxiety Scale and Body Image Scale was given to the participants who approved the Informed Consent Form stating that participation and completion of the study was voluntary. In the analysis of the data, SPSS 25 program was used for descriptive information and SPSS Process v.4.2 plug-in was used for regulatory effect detection. Before evaluating the results, basic assumptions were examined. The normality assumption was evaluated based on the condition that the skewness and kurtosis values were between -2 and +2 (George & Mallery, 2010). Since the skewness and kurtosis values of the variables were within the desired range, it was seen that the normality assumption was met. For multicolinearity, correlation coefficients between variables and variance inflation factor (VIF) values were evaluated. It is seen that the correlation coefficient between variables is .553 and VIF values are 1.000. Since the VIF values were below 10 and the correlation coefficients were below .80, it was shown that there was no multicollinearity (Büyüköztürk, 2010).

3. Findings

3.1. Descriptive Findings

Descriptive findings of the inventories are given in the Table. According to the findings, the mean of the Recreation Anxiety Scale was 58.66 (SD= 16.498), while the mean of the Body Image Scale was 51.93 (SD= 14.745).

Table 2. Descriptive Findings Related to the Scales

Variables	N	Min.	Max.	Average	Standard Deviation	Kurtosis	Skewness
Recreation Anxiety Scale	295	25	98	58.66	16.498	-0.326	0.313
Body Image Scale	295	23	98	51.93	14.745	0.111	0.645

3.2. Reliability and Validity Findings Regarding Inventories

Reliability and validity analyzes of the inventories were conducted. Accordingly, the Cronbach Alpha value of the Recreation Anxiety Scale was determined as .906. The Cronbach Alpha value of the Body Image Scale was determined as .914. The value determined for both scales can be interpreted as high reliability (Aksu et al., 2017). The Kaiser-Meyer-Olkin Measurement (KMO) value of the Recreation Anxiety Scale was found to be .789 (Bartlett's Test= p<.05). This value can be interpreted as a moderate value close to good. The Kaiser-Meyer-Olkin Measurement (KMO) value of the Body Image Scale was .817 (Bartlett's Test= p<.05). This value can be interpreted as good (Büyüköztürk, 2010). In addition, the total variance explained by the items of the Recreation Scale was 62.36%, while the total variance explained by the items of the Body Image Scale was 66.97%.

Table 3. Reliability and Validity Findings of the Scales (Exploratory Factor Analysis)

	RELIABILITY	VALIDITY (Exploratory Factor Analysis)	
Scales	**Cronbach Alpha**	**KMO**	**Total Variance Explained**
Recreation Anxiety Scale	.906	.786	%62.357
Body Image Scale	.914	.817	%66.971

The goodness of fit values for confirmatory factor analysis of the inventories are given in the table. When we look at the value ranges of the goodness of fit values, a χ2/df value below 2 is considered as a good fit value (Cole, 1987). Accordingly, it is seen that these values indicate good fit in both inventories. For the GFI value, above 0.90 is considered as good fit and above 0.95 is considered as perfect fit (Chow, Snowden & McConnerll, 2001). Accordingly, it is seen that the GFI value of the Recreation Anxiety Scale shows a good fit and the Body Image Scale shows a good fit close to perfect. For the CFI value, above 0.80 is reported as acceptable and above 0.90 is reported as good fit value (Chow, Snowden & McConnerll, 2001). Accordingly, the value of the Recreation Anxiety Scale is considered good and the value of the Body Image Scale is considered acceptable. For the NFI value, it is reported in the literature that above 0.80 is acceptable and above 0.90 is good fit value (Hooper et al., 2008). Accordingly, the value of the Recreation Anxiety Scale indicates a good fit, while the value of the Body Image Scale is acceptable. Finally, for the RMSEA value, up to 0.10 is considered as poor fit and below 0.08 is considered as acceptable fit (MacCallum et al., 1996; Schermelleh-Engel et al., 2003). Accordingly, both inventories have a poor fit.

Table 4. Validity Findings Regarding the Scales (Confirmatory Factor Analysis)

	χ2/df	GFI	CFI	NFI	RMSEA
Recreation Anxiety Scale	1.89	0.921	0.917	0.903	0.074
Body Image Scale	1.99	0.941	0.881	0.851	0.094

3.3. Findings on the Relationships Between Variables

When we look at the descriptive information of the inventories, it was assumed that the data were normally distributed because the number of participants was over 30 and the kurtosis and skewness values of both inventories were between +1 and -1 (Field, A., 2009; Hair et al., 2013). For this reason, the correlation relationship was examined with Pearson test (Field, A., 2009). According to the correlation test data, there is a positive and moderately significant relationship between body image and recreation anxiety (r=.55, p<.001).

Table 5. Findings on the Correlation Relationship Between the Scales

		Body Image Scale
Recreation Anxiety Scale	Pearson Korelasyon	,553**
	Sig.	,000
	N	295

**p<.001

According to the findings of the regression analysis in which recreation anxiety was taken as the dependent variable and body image as the independent variable, it was found that body image predicted recreation anxiety (B=.55, t=11.36, p<.001, 95% CI[.51-.73]; F(1,293)=129.05, p<.001). Accordingly, body image alone explains 30% of recreation anxiety (R2=.30).

Table 6. Findings on the Regression Relationship between the Scales-Linear Regression Analysis with Recreation Anxiety as the Dependent Variable

	Regression Coefficient	Standard Error	p	95% Confidence
Body Image Scale	.619	.306	.000	[.512-.726]

In the descriptive information of the inventories, normal distribution of the data was determined (Field, A., 2009; Hair et al., 2013). For this reason, Independent Sample T Test was used to determine the mean difference between gender groups in the inventories (Field, A., 2009). According to the results of the analysis, it was determined that the variances of the data of the Recreation Anxiety Scale were homogeneous (Levene Test p>.05). On the other hand, it was determined that the variances of the Body Image Scale data were not homogeneous (Levene Test p<.05). For both scale scores, no significant difference was found between gender groups in total score (p>.05).

Table 7. Independent Sample T Test Results

Variables	Levene Test		T Test			
	F	p	t	df	p	%95 Confidence
Recreation Anxiety Scale	0.130	.718	1.277	293	.203	[-1.327 – 6.227]
Body Image Scale	36.507	.000	0.953	250.598	.341	[-1.743 – 5.012]

3.4. The Moderating Effect of Gender on the Relationship Between Variables

In order to reveal whether there is a moderating effect between the variables in this study, the Process Macro developed by Andrew F. Hayes (Hayes, 2013) was used. The moderating effect reveals in which situations and how the effect of the independent variable will increase or decrease. If there is a moderating effect, the slope test will be applied to determine in which situations (low, medium, high) it changes (Gürbüz, 2019).

When the moderating effect of gender factor in the relationship in which body image predicts recreation anxiety is examined; it is seen that gender factor does not have a moderating effect in this relationship (β=1.169, p>.05). For this reason, in order to understand how the moderating effect changes situationally; slope analysis, which reveals the status of being male and female, was not needed.

Table 8. Findings of the Moderating Impact Analysis

Variables	β	Standard Error	t	p	%95 Confidence
Constant	55.747	.800	69.662	.000	[54.172 - 57.322]
Body Image (X)	9.757	.882	11.063	.000	[8.021 - 11.492]
Gender (W)	-.685	.802	-.854	.394	[-2.262 - 0.893]
Interaction Effect (X*W)	1.169	.885	1.830	.068	[-0.122 – 3.360]

4. Discussion And Conclusion

The aim of this study is to examine the relationship between body image perception and recreation anxiety levels among individuals participating in sports recreation activities and to assess whether gender plays a moderating role in this relationship. To this end, analyses were conducted using data obtained from a total of 295 individuals aged between 19 and 55.

The first question of the study is whether there is a statistically significant relationship between body image perception and recreation anxiety. For this purpose, a correlation analysis was performed. As a result of the analysis, the null hypothesis was rejected. A positive and significant relationship was found between body image anxiety and recreation anxiety. The effect size of this correlation is large. This reveals that increasing body image anxiety is

associated with increasing recreation anxiety. When reviewing the literature, there is no research that directly examines the relationship between recreation anxiety and body image perception. However, recreation anxiety is considered a limiting factor in participation in recreational activities and expresses the anxiety and stress individuals experience regarding participation in leisure time activities. The findings of the study show that as individuals' negative perceptions of their bodies increase, their avoidance of recreational activities also increases (Atalay & Gençöz, 2008; Vartanian & Shaprow, 2008). In addition, it has been found that individuals who participate more in recreational activities have higher positive perceptions of their bodies (Campbell & Hausenblas, 2009). Furthermore, it has been observed that as individuals' dissatisfaction with their bodies increases, their anxiety levels also increase (Johnson & Wardle, 2005). When the results of the literature are evaluated together, it is seen that as individuals' body dissatisfaction increases, their anxiety increases and they avoid sports activities. The relationship between the increasing negative body image obtained in the research and increasing recreation anxiety supports these findings. In particular, the increasing negative evaluation of their bodies by individuals who participate in sports activities distances them from the ideal body image. This anxiety about body image may trigger feelings of inadequacy due to the threat of comparison that comes with being visible in recreational activities, leading to recreation anxiety and, consequently, avoidance of sports activities (Frederick & Morrison, 1996; Tiggemann & Slater, 2001). Furthermore, negative evaluations of body image may cause a decline in the belief in one's ability to engage in physical activity among individuals who participate in sports. This may be related to an increase in recreation anxiety (McAuley et al., 1991).

Another question addressed in the study is whether gender moderates the relationship between body image perception and recreation anxiety. Therefore, a moderation analysis was conducted. The results of the analysis did not reject the null hypothesis. The result reveals that the relationship between body image perception and recreation anxiety is significant, but gender does not have a moderating role in this relationship. In other words, it shows that the strength of the relationship between body image perception and recreation anxiety does not change depending on whether the person is female or male. At the same time, it was observed that body image perception and recreation anxiety scores did not differ between women and men. The results of both the moderation test and the between-groups comparison test reveal that both gender groups evaluate body image perception similarly and that there is no significant difference in their levels of recreation anxiety. Results comparing body image perception across genders appear to be inconsistent. Some studies report that women have more negative body image perceptions, while others find no gender difference. This suggests that the role of other factors beyond gender in body image perception is more effective in explaining body image perception. When gender-based body perception is examined, it is seen that there is no difference between women and men in terms of body satisfaction, but the factors at the focus of dissatisfaction vary. In other words, both women and men are similarly dissatisfied with their bodies; however, women desire a slimmer body, while men desire a stronger, more muscular body. Therefore, it is expected that body image perception scores for women and men would be similar. When the results were evaluated in terms of recreation anxiety, although general anxiety levels were higher in women, the results for recreation anxiety did not support this finding. In gender comparisons of general anxiety levels, it is frequently stated that anxiety levels are higher in women (Kessler et al., 2005; Rosenfield et al., 2013). However, evaluations related to recreation indicate that there is no difference between genders. In a study conducted by Kinkawa et al. (2024), it was found that Leisure Time Scale scores did not differ between genders. A similar result was obtained in another study conducted by Yurcu (2021). It was reported that the perception of leisure time attitudes did not change depending on gender. In summary, the relationship between body image perception and recreation anxiety appears similar across genders. This suggests that, although in different ways, expectations of ideal body image lead to negative cognitions in both gender groups, and that both gender groups exhibit similar levels of recreation anxiety, albeit for different reasons.

The study has various contributions and limitations. While studies on recreation and anxiety are numerous, the concept of anxiety discussed describes a general state of anxiety. Therefore, these explanations are insufficient to explain recreation anxiety. This study specifically addresses recreation anxiety and attributes it to various factors. However, the limited number of studies on recreation anxiety limits literature comparisons and weakens the discussion. Looking at this situation from another perspective, it is thought that this study could be one of the pioneering studies on the subject. In addition to explaining the relationship between body image perception and recreation anxiety, the study also explores this relationship based on gender. While the results indicate no gender differences in this relationship, they fall short of explaining how different genders experience this body evaluation and anxiety related to recreational activities. It is necessary to examine the domains in which men and women experience recreation anxiety and whether body image interpretations differ across domains. Another issue is sample size. Although the research sample was sufficient

for the analyses, the generalisability of the research findings is limited due to the sample size for external validity. Furthermore, if the RMSEA value reveals poor fit, it may be that the RMSEA value is affected by the sample size. It is considered that the generalisability of a study involving larger samples and more diverse populations would be higher.

It is well-documented that recreational activities have a positive effect on mental health. Consequently, it is recommended that an examination of the factors that restrict and support recreational activities, alongside the explanations to be developed on this subject, will contribute to the applications to be made in the field, in addition to the theoretical knowledge. It is recommended that studies be conducted with different cultures and cross-cultural studies. Moreover, the development and implementation of psychological interventions for recreation anxiety, in conjunction with the execution of studies on negative cognitions pertaining to body image, is poised to foster participation in sporting recreational activities and enhance psychological well-being.

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Researches on Multidisciplinary Approaches Multidisipliner Akademik Yaklaşım Araştırmaları

Research Article

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Approval-Seeking in Social Media: Moderating Role of Social Comparison and Cyber Values[1]

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Abstract

Young people, as consistently reported in the recent literature, frequently engage in social media. They are more inclined to make social comparisons to determine their self-worth through metrics such as likes, and the number of followers. These comparison tendencies function as underlying needs for approval-seeking. However, online social interactions often result in ethical violations. Therefore, cyber human values should be scrutinized in virtual environments. This cross-sectional study aimed to examine whether approval-seeking predict users' digital behaviours and how psychological processes and ethical values influence users' behaviours in social media ecosystems. After an a priori power analysis using G*Power, it was determined that 263 participants (at least) would suffice to detect a medium effect size with % 80 power. A convenience sample of 270 university students responded to an online survey via Google Forms comprised of 66 items. The results provided a positive significant relationship between social comparison and social media use ($r = 0.293$, $p < .01$). Approval-seeking significantly predicted social media use at both moderate ($B = .294$, $p = .001$) and high levels of social comparison ($B = .447$, $p < .001$), whereas cyber human values did not significantly moderate the relationship between approval-seeking and social media use. This research was theoretically grounded utilizing Social Comparison, Self-Presentation, and Self Determination theories. It is concluded that due to their interactive design, social media platforms not only facilitate self-presentation, but also enable users to meet basic human needs (autonomy, competence, and relatedness) through digital expression and interpersonal feedback.

Keywords: Approval-Seeking, Cyber Values, Social Comparison, Social Media Use.

JEL Codes: I10, I30, I31

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1. Introduction

Social media has become an undeniable platform for interpersonal communication, identity exploration, and emotional regulation, especially among young adults in today's digital society. Ubiquitous mobile devices and online applications allow individuals to engage in social interactions through digital channels that were not previously possible. Social media platforms constantly offer individuals the opportunity to present selected aspects of themselves and gain approval through likes, comments, and shares. This phenomenon has been conceptualized as social validation, which refers to individuals' attempts to gain approval from others for their preferences in digital interactions (Ballara, 2023). Social validation, referred to as "approval-seeking" in this study, is not accidental. Studies have shown that it is based on basic human psychological needs such as social acceptance, belonging, recognition, and identity reinforcement (Nesi & Prinstein, 2015, Yenilmez Kaçar, 2023).

Social Comparison Theory (Festinger, 1954) provides an important theoretical perspective on why individuals compare themselves to others. This theory posits that we compare certain aspects of ourselves (e.g., our behaviours, opinions, status, and success) to others, leading to a better self-image (Buunk & Gibbons, 2007). In today's digital age, social media offers a fertile ground for making upward and downward comparisons. The frequency and direction of these comparisons can significantly alter the relationship between approval-seeking and social media use, with important implications for users' mental health and well-being (Taylor & Armes, 2024). A recent meta-analysis (McComb et al., 2023) provides robust findings on how upward social comparisons lead to negative mood and self-evaluations. Salerno et al. (2025) reported in a longitudinal study that online social comparison tendencies predict excessive social media use.

Young adults are more likely to be digitally engaged, and their use of social media has increased significantly in recent years. Statistics show that more than half of global social media users are young adults, with those aged 20-29 (31.8%) being the most "active" social media users (Smith, 2024). Empirical studies show that younger users (Gen Z and young millennials) are more prone to social comparison and digital validation (Pew Research, 2024). Social media use is influenced by age, gender, level of education, time spent online, and preferred devices for accessing social media. A recent qualitative study (Derbaix et al., 2024) highlights that age, gender and media literacy influence users' engagement and their online social comparison tendencies. Therefore, demographic variables are important to understand differences in social media interaction and its psychological effects.

According to Self-Presentation Theory (Goffman, 1959) individuals manage their impressions to influence others' perceptions. Recent empirical evidence supports the idea in digital contexts. Self-presentation is an important component of social interaction on social media platforms and gives a dynamic direction to users' self and identity construction (Yang & Ying, 2021). Thus, users constantly present themselves in digital environments to appear more attractive and more socially connected. Young individuals find social media desirable because social media provides immediate interaction and feedback to users for developing a sense of self and identity (Skogen et al., 2020). Moreover, digital platforms serve a space for users to present different versions of themselves through managing their impressions (Fullwood et al., 2020). In addition, social media platforms provide users opportunity to curate content, increasing the likelihood of selective self-presentation (Meeus et al., 2023).

Each social media platform demands different features for self-presentation (Hollenbaugh, 2021). Therefore, the self-presentation strategy used may vary depending on the platform preferred. A recent study (Muyidi, 2025) found that excessive time spent on social media was associated with using more self-presentation strategies, and that cultural context also shaped these different strategies. Likewise, social media users' selective self-presentation may diversify depending on who the audience is. Because self-presentation requires a target audience and users constantly weigh what their audiences perceive. The audience of the shared content has been found to be the most important criterion for self-presentation (e.g. Lowe-Calverley & Grieve, 2018). Recent studies suggested that excessive self-presentation was associated with anxiety and poor mental health (e.g. Hjetland et al., 2024; Muyidi, 2025) In addition to its negative effects, self-presentation on social media can increase young people's overall subjective well-being in the long term through social approval (Simpson & Janse van Vuuren, 2025).

Behaviours during social interactions in digital environments should include ethical values that all users must comply with. Ethics is a set of values that direct people determine their actions in the real world (Sari et al., 2020). Likewise, one can extend societal norms and values to digital context to shape the social interactions of users with each other on social media platforms (Santhosh & Thiyagu, 2024). Virtual environments offer users countless opportunities to interact on a global scale. However, these social interactions often result in violations of ethical norms (Rösner et al., 2016). Since users are inclined to express their spontaneous ideas on social media platforms, they may unknowingly disregard ethical values (such as respect, honesty, tolerance, and digital responsibility). Their psychological burdens (likes, thoughts, emotions, etc.) may not match those

of the interlocutor. Human values, which are closely tied to ethics, serve as a guide for individuals in daily life and help determining their priorities. These values are internalized over time and serve as enduring beliefs. Thus, while browsing online, we can assume that social media users reflect these core beliefs. Cyber values, in this context, play an important role in understanding the core beliefs and defining ethical behaviours in virtual environments. (Kılıçer et al., 2017).

Despite increasing research on social media use and mental well-being, very little research has been conducted to examine the interconnected effects of approval-seeking behaviour, social comparison, and cyber-human values within a single framework. A critical gap in understanding persists regarding how psychological vulnerabilities and ethical orientations affect user behaviour. To our knowledge, earlier studies lacked a comprehensive examination of the moderating role of social comparison tendencies between approval seeking and social media use. Moreover, the theoretical framework integrating Social Comparison Theory, Self-Determination Theory, and Self-Presentation Theory provides a multidimensional perspective for future research addressing theoretical gaps in social media behaviours.

In line with this purpose, this study aimed to examine whether external validation predict digital behaviours and how human psychological processes and ethical digital values influence user behaviours in social media ecosystems. A cross-sectional survey design was adopted to explore the relationships between approval seeking, social comparison, and social media use. An online survey was administered to students at Çağ University via Google Forms during 2024-25 Spring term. Building on the literature, a conceptual model was proposed in which approval seeking, social comparison tendencies, and cyber human values were examined as the key components of social media use among university students. Grounded in three social psychological theories, the model explored how basic human needs for approval and social validation shaped digital behaviours. Accordingly, this study tested three hypotheses addressing both direct and moderated relationships between research variables and aimed to clarify psychological mechanisms underlying social media engagement among young adults.

2. Conceptual Framework and Theoretical Grounding

As of April 2025, 5.31 billion social media users (64.7% of the global population) indicate that more than a half of the users all around the world are getting more engaged in digital environments rather than real-life activities. What is more, a typical social media user is spending an average of 18 hours and 41 minutes per week actively for using or visiting social platforms (CrowdStrike, 2025). It is obvious that social media platforms are not merely venues for communication but also for self-presentation (Zheng et al., 2020), identity construction (Gündüz, 2017), and validation (Ballara, 2023). There may be several reasons why so many people spend considerable time in digital environments. However, the focus of this research on social media use was theoretically grounded in three social psychological frameworks. Self-Presentation Theory (SPT) (Baumeister & Hutton, 1987), Self-Determination Theory (SDT) (Deci & Ryan, 2000), and Social Comparison Theory (SCT) (Festinger, 1954) provided a framework to examine young adults' approval-seeking behaviour, and their tendencies towards social comparison.

Self-Presentation Theory argues that individuals engage in behaviours to convey their own information or images to others. The motivations behind these behaviours are relatively stable but can change depending on situational factors. The theory asserts two separate propositions for self-presentation motivation: evaluative presence and knowledge of others about the individual's behaviour. The motivation of the individual in the first proposition, called as "pleasing the audience", is to match one's self-presentation with the expectations and preferences of his/her audience. The latter proposition, called as "self-construction", is the motivation that the individual attempts to match his/her self-presentation with his/her ideal self (Baumeister & Hutton, 1987:71).

In this respect, self-presentational motivations through posting on social media correspond to the public display of the users (Zheng et al., 2020). These attempts can be considered as the manifestations of self-construct. Human beings have an innate tendency to be accepted and they strive to manage how others perceive them (Goffman, 1959). This phenomenon may explain why social media users prefer to share their curated images to gain social approval from others (Hjetland et al., 2022). It is plausible that approval-seeking behaviours have increased with the rise in social media use. Human beings are in need for constant validation of others. Inclined to get more favourable responses, they delete or edit their shared content meticulously.

Technological facilities offer users various opportunities for self-disclosure and self-expression in digital environments. Through approval metrics (likes, follows, etc.), social media provides further and instant feedback to users whereas face-to-face interactions may carry certain risks of interpretation. People are concerned to please their audiences, whether they are close or distant friends, on social media. Self-presentation is a purposeful behaviour performed in front of an audience and individuals desire to enhance their visibility on social circles.

Success depends on how much one's self-presentation is appreciated by others (Hollenbaugh, 2021). In addition, it can be hard for the user to manage his/her impression on social media platforms that allow others to contribute to the content shared. The desire for approval reflects the self-presentational motivations. Therefore, social media users frequently take their audiences' preferences into consideration (Lowe-Calverley & Grieve, 2018) because tags and comments have remarkable impacts on the user's self-presentation.

Self-Determination Theory (Deci & Ryan, 2000), as a holistic motivation theory, suggests that an individual's behaviour is affected by internal factors (feelings, thoughts, etc.) and external factors (environment). The theory posits that people are motivated by three innate (and universal) psychological needs. Autonomy is the sense that individuals feel they have control over their own behaviour and goals. Competence indicates that an individual has the potential required to perform any behaviour. Relatedness refers to the individual's need to have enduring and intimate relationships with some significant others.

Social media offers individuals opportunities to interact with a wide variety of audience, activities, and applications (Weinstein, 2018). In terms of autonomy, this provides trials for users to feel the sense of control, self-management, personal agency, and contribution to the sense of empowerment by allowing them to organize their public lives on their own terms (West & Vella-Brodrick, 2024). In addition, social media platforms render users many opportunities to test their competence. Digital technologies require specific sets of technical and cognitive skills. Consuming and responding to contents on platforms, participating in cyber communities via hashtags, taking perspective, "having a say" in short, increase the individual's self-esteem and enable them to have a positive sense of self (Budd et al., 2016).

Relatedness can be considered as the most salient feature of social media in the context of Self-Determination Theory. Social media interactions, which might be the continuation of real-world relational ties, facilitate the expansion of social networks regardless of geographical boundaries and provide a sense of recognition and reciprocity (Rousseau et al., 2019). The potential in social media for approval and social influence on others ensures the fulfilment of need for relatedness (Gangadharbatla, 2008). Using social media to bridge and bond with others and devoting to the maintenance of these newly established ties through digital interactions suggest that "need to belong is a powerful, fundamental, and extremely pervasive motivation." (Baumeister & Leary, 1995:497).

Social Comparison Theory (Festinger, 1954) suggests that individuals determine their self-worth by comparing themselves to others. According to the theory, we utilize other people as sources of information and relying on these sources, we make judgments about our abilities, behaviours, or thoughts. Comparisons may include anything concerning the individual such as lifestyle, achievements, appearance, economic status, etc. According to Festinger (1954), human beings have a desire to compare themselves against others to determine their capabilities or accuracy of their ideas, and to determine a benchmark of what they aim to achieve. Social comparison tendencies, regardless of the direction or type, explain a process related to how self-knowledge is acquired. The theory proposes three types of social comparisons. The direction of the comparisons does not always guarantee positive or negative results for the individual.

In upward comparison, the individual compares himself/herself to someone who is superior. The motivation for upward comparisons is stronger when the comparison is made covertly rather than explicitly, if the individual is not at risk of being evaluated as inferior/bad, and when the individual makes investment into a feature or an ability. However, it can lead to negative emotions such as inferiority and depression (Cohen et al., 2017). In downward comparisons, the individual compares himself/herself to someone inferior. We are more likely to engage in downward social comparisons when our sense of self and well-being are threatened; these comparisons help us feel better about ourselves (Buunk & Gibbons, 2007). Downward comparisons boost the experience of positive emotions such as happiness while increasing our self-esteem and reducing anxiety. Lateral comparisons are usually made with peers or people who are equal in terms of a specific feature. They usually do not cause distress and the individual feels neither superior nor inferior.

Whether they use social media passively by browsing their own feeds or visiting others' profiles, or actively by sharing posts or sending messages, individuals are inclined to make comparisons on social platforms. The critical point here is the direction of the social comparisons, because it has diverse effects on the individual's social and psychological well-being. Research indicate that active use has more positive effects on psychological health than passive use, while passive use may trigger feelings such as hostility and envy (Verduyn et al., 2017).

It is common for users to make social comparisons to determine their self-worth through metrics such as likes, the number of followers, prompts, alerts, and views of the content (Samra et al., 2022). Consequently, most young users think that people (influencers, in particular) in their feeds are happier, wealthier, and more successful than they are (Chou & Edge, 2012). Social comparison in social media requires considerable attention. Considering the statistics, young adults are at risk for adverse effects

of social comparison in pursuit of a measure for self-worth (Prichard et al., 2021). This phenomenon can be considered as an adhesion to social feedback loops for self-validation through either content-based or image-based social platforms.

2.1. Research Hypotheses

To examine the interplay between approval-seeking behaviour, social media use, social comparison tendencies, and cyber human values among young adults, three hypotheses were generated. Self-Determination Theory (SDT) proposes that human beings have an innate tendency to fulfil three fundamental needs. Relatedness, one of which, refers to the desire of connectedness to others and is very central to the sense of being loved and cared for (Deci & Ryan, 2000). Individuals are in a constant search for validating whether they are loved or accepted by some significant others. In purpose for this affirmation, they try to collect social feedback in real world settings. Social media, which can be considered as a displacement of the real world in today's digital environment, provides human beings numerous opportunities to fulfil the need of relatedness. The more the need is met, the more the individual is engaged in social media for approval-seeking. It has been hypothesized that individuals with higher approval motivation would be more likely to engage frequently and intensively with social media platforms:

H1: Approval-seeking behaviour will positively predict social media use among young adults.

Social Comparison Theory (SCT) posits that we fail to accurately self-assess our attitudes and abilities, especially in the absence of objective standards or when faced with uncertainties about our own position in a particular domain. Instead, we inherently compare ourselves to other people for an evaluation (Festinger, 1954). Social media provides countless platforms for users to present their selves and the interlocuters are exposed to the presented contents. Whether the account appeared in their feeds on social media platform is followed or not, users generally make either upward or downward social comparisons through these presented contents. Social media with an interactive nature allows users to interact with relatively filtered, idealized, and curated selves/lives of individuals which may then lead to persistent but unhealthy social comparison tendencies (Qui, 2024). It has been hypothesized that:

H2: Social comparison tendencies will moderate the positive relation between approval-seeking behaviour and social media use.

In their Functional Theory of Values (FTV), Gouveia et al. (2014) discuss that values function as a guide to human actions, and as expressions of human needs. The authors explain from an evolutionary perspective that social groups have created sets of values to bond with one another, resist threatening demands, and create shared meanings in their social interactions. These values are essential to survive and to meet basic needs. In psychological respect, human values function as rules for individuals to regulate their actions and needs in social circles. Cyber values, on the other side, can be defined as the set of rules based on basic human values and applied in cyberspace interactions (Shun Xiang & Hasbullah, 2023). Cyber human values (such as respect, responsibility, being peaceful, etc.) are crucial in social media use in terms of ethics. It has been hypothesized that individuals who have internalized cyber human values would resist to conform to socially reinforced approval metrics and behave responsibly in their social media interactions:

H3: Cyber human values will moderate the relationship between approval-seeking behaviour and social media use.

3. Research Methodology

3.1. Research Model

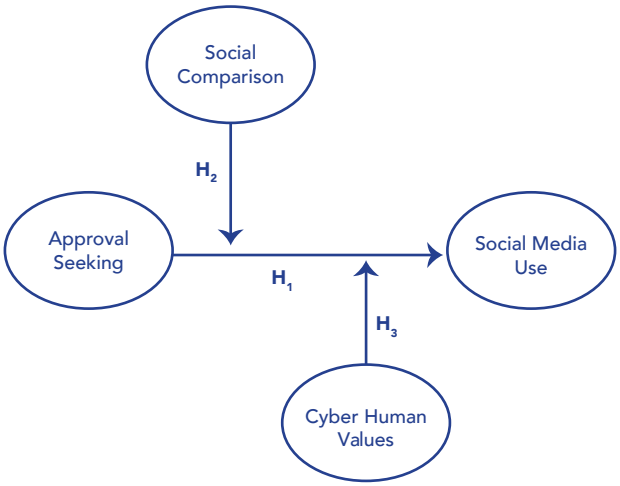

Figure 1. The Research Model

In this study, approval seeking was selected as the independent variable (IV), while social media use was assigned as the dependent variable (DV). The model (see Figure 1) also examined the moderating role of social comparison, based on the assumption that individuals' efforts for external validation might lead them to engage in social comparisons on social media platforms, which in turn might pose a risk for excessive use. Additionally, cyber values were tested as a moderating variable to explore whether the strength of the relationship between approval seeking and social media use varied according to the participants' internalized digital norms and ethical awareness.

3.2. Participants

This study utilized a quantitative, correlational, and cross-sectional survey design. The aim was to explore the relationships between approval-seeking behaviour, social media use, social comparison, and cyber human values. Young people, as consistently reported in the recent literature (Nesi & Prinstein, 2015), frequently engage in social media and they are more inclined to make social comparisons to determine their self-worth through metrics such as likes, and the number of followers on social media platforms. Accordingly, university students were recruited as the target population of the study.

A convenience sample of 270 university students, both at undergraduate and graduate degrees, were selected on a voluntary basis and no incentive was offered. Informed consents were obtained before an online survey via Google Forms was administered. To determine the minimum sample size for a medium effect size (f2=0.05) in a multiple regression analysis, an a priori analysis was conducted utilizing G*Power 3.1 (Faul et al., 2007). In line with Cohen's (1988) criteria and for moderation analysis within the PROCESS macro (Hayes, 2022), the required sample size was calculated to be 263 participants to achieve a statistical power of 0.80 at a significance level of α=.05. Since the sample size provided adequate power for the analyses, data collection via Google Forms was concluded once the submitted responses reached 270 participants.

3.3. Measures

The survey comprised of 66 items, most of which were Likert-typed rating. All variables were measured through self-report questionnaires. Four standardized measurement instruments were used in this study to evaluate participants' demographic traits, social media use, social comparison tendencies, ethical values in online interactions, and inclinations toward social approval. Participants' propensity to pursue social approval was assessed using the Martin-Larsen Revised Approval Motivation Scale (MLAMS; Larsen & Martin, 1984). The Social Media Use Scale (SMUS; Tuck & Thompson, 2024) was used to gauge the frequency, and level of social media platform engagement. Individual differences in social comparison tendencies were measured using the Iowa-Netherlands Comparison Orientation Scale (INCOM; Gibbons & Buunk, 1999). The Cyber Human Values Scale (i-Values; Kılıçer et al., 2027) was used to weigh participants' ethical values in digital interactions. Demographic information was also gathered using an 8-item Personal Information Form. The participants spent approximately 8-10 minutes to complete the survey. In addition, the online format was optimized for clarity and ease of use to enhance data quality.

Reliability analyses in the current sample provided the Cronbach's Alpha coefficients as follow: For The Approval Motivation Scale as 0.914; for The Social Comparison Orientation Scale as 0.863; for The Cyber Human Values Scale as 0.875; and for The Social Media Use Scale as 0.926. The results suggested high levels of reliability for all measures.

3.4. Data Analysis

To analyse the data, descriptive statistics, correlation analysis, and moderation analyses were conducted. First, the demographic characteristics of the participants were determined using frequency and percentage distributions. Then, descriptive statistics including means, standard deviations, and minimum and maximum values of the scale scores, were calculated. Next, Pearson correlation analysis was employed to examine the relationships between the scales, and to assess the directions and associations among variables. Finally, moderation analyses were performed using the PROCESS macro for SPSS (Model 1) as suggested by Hayes (2022), to test the direct, indirect, and moderating effects among the specified variables. The significance level was set at .05. Data analyses were conducted using the SPSS Statistics version 22.0.

3.5. Ethical Considerations

This non-invasive research was conducted in accordance with the ethical standards outlined in the Declaration of Helsinki and approved by Çağ University Scientific Research and Publication Ethics Committee (Approval No: E-81570533-604.01.01-2500002825, Date: 25.03.2025).

4. Findings

4.1. Descriptive Features of The Participants

The descriptive characteristics of the participants are presented in Table 1. Of the individuals participated in the study, 68.9% (n=186) were female and

31.1% (n=84) were male. Regarding age distribution, 7.4% of the participants were between of 18 and 20 years old, 54.1% were between 21 and 25 years old, 8.9% were between 26 and 30 years old, 9.6% were between 31 and 35 years old, 4.4% were between 36 and 40 years old, and 15.6% were 41 years old or older. In terms of educational status, 41.5% of the participants were high school graduates, 24.4% held a bachelor's degree, and 34.1% had a postgraduate degree.

Regarding daily smartphone usage time, 2.2% of the participants reported using smartphones for less than 1 hour per day, 13.3% for 1-2 hours, 43.7% for 3-4 hours, and 40.7% for more than 5 hours. In terms of time spent on social media platforms, 8.9% spent less than 1 hour per day, 33.3% spent 1-2 hours, 44.4% spent 3-4 hours, and 13.3% spent more than 5 hours. Most participants (95.6%) accessed social media platforms via smartphones, while 1.5% use laptops, and 3.0% used desktop computers. Concerning the social media platforms on which participants spend the most time, 57.8% reported using Instagram, 0.7% Facebook, 11.1% TikTok, 14.8% Twitter and 15.6% YouTube.

Table 1. Frequencies and Percentages of the Participants

Groups	Frequency (n)	Percentage (%)
Gender		
Female	186	68.9
Male	84	31.1
Age		
18-20	20	7.4
21-25	146	54.1
26-30	24	8.9
31-35	26	9.6
36-40	12	4.4
41+	42	15.6
Latest Graduation		
Highschool	112	41.5
Undergraduate	66	24.4
Graduate	92	34.1
Screen Time		
Less Than 1 Hour	6	2.2
1-2 Hours	36	13.3
3-4 Hours	118	43.7
More Than 5 Hours	110	40.7
Social Media Time		
Less Than 1 Hour	24	8.9
1-2 Hours	90	33.3
3-4 Hours	120	44.4
More Than 5 Hours	36	13.3
Device Used		
Smartphone	258	95.6
Laptop	4	1.5
Personal Computer	8	3.0

Most Used Platform		
Instagram	156	57.8
Facebook	2	0.7
Tiktok	30	11.1
Twitter	40	14.8
Youtube	42	15.6

The average scores of the participants on Approval Seeking, Social Comparison, Cyber Human Values and Social Media Use scales are presented in Table 2. The average Approval-Seeking score was M= 2.565 (SD = 0.497), with a range of 1.500 to 3.900. The average score for The Social Comparison Scale was M= 3.226 (SD = 0.696), ranging from 1.000 to 4.830. The average score for The Cyber Human Values Scale was M= 3.484 (SD = 0.503), with a minimum and maximum values of 1.000 and a maximum of 5.000, respectively. Finally, the mean Social Media Use score was M= 2.779 (SD = 1.373), and ranging from 1.000 to 9.000.

Table 2. Mean Scores of Measures

	N	Mean	Ss	Min.	Max.
Approval Seeking	270	2.565	0.497	1.500	3.900
Social Comparison	270	3.226	0.696	1.000	4.830
Cyber Human Values	270	3.484	0.503	1.000	5.000
Social Media Use	270	2.779	1.373	1.000	9.000

To determine the relationships between variables, Pearson correlation analyses were performed. Approval seeking had positive and significant relationships with Social Comparison ($r = 0.389$, $p < .01$), and with Social Media Use ($r = 0.293$, $p < .01$), but a negative significant relationship with Cyber Human Values ($r = -0.161$, $p < .01$). There was a significant relationship between Social Comparison and Social Media Use ($r = 0.293$, $p < .01$), but no significant relationship was found between Social Comparison and Cyber Human Values ($r = 0.071$, $p = .244$) (Table 3).

Table 3. Correlation Analyses of Measures

		Approval Seeking	Social Comparison	Cyber Human Values	Social Media Use
Approval Seeking	r	1.000			
	p	0.000			
Social Comparison	r	0.389**	1.000		
	p	0.000	0.000		
Cyber Human Values	r	-0.161**	0.071	1.000	
	p	0.008	0.244	0.000	
Social Media Use	r	0.293**	0.293**	0.017	1.000
	p	0.000	0.000	0.784	0.000

**<0.01; Pearson Correlation Analysis

This study examined whether the relationship between approval-seeking behaviour (AS) and social media use (SMU) was moderated by social comparison tendencies (SC). The overall model was statistically significant ($R = .374$, $R^2 = .140$, $F(3,266) = 14.400$, $p < .001$), indicating that the model accounted for 14% of the variance in social media use. Upon the examinations of the regression coefficients, approval-seeking was found to significantly and positively predict social media use ($B = .294$, $SE = .085$, $t(266) = 3.471$, $p = .001$, 95% CI [.127, .461]). Similarly, social comparison also significantly and positively predicted social media use ($B = .327$, $SE = .086$, $t(266) = 3.785$, $p < .001$, 95% CI [.157, .497]). Importantly, the interaction term between approval-seeking and social comparison was also statistically significant (B

= .153, SE = .068, t (266) = 2.238, p = .026, 95% CI [.018, .288]). This result suggested that the strength of the relationship between approval seeking and social media use varied significantly as a function of participants' social comparison tendencies.

As a result of the conditional effects analysis, the effect of approval seeking on social media use was not statistically significant among participants with low levels of social comparison tendency (B = .141, p = .191). However, approval seeking significantly predicted social media use at both moderate (B = .294, p = .001) and high levels of social comparison (B = .447, p < .001). These findings indicated that approval-seeking behaviour had a stronger impact on social media use when participants exhibited higher social comparison tendencies (Table 4).

Table 4. Moderation Analysis: Effects of Approval-Seeking and Social Comparison on Social Media Use and Conditional Effects Results

Variable	B	SE	t	p	95% CI	95% CI
					Min.	Max.
Constant	2,720	,082	33,043	<,001	2,558	2,882
AS (Approval Seeking)	,294	,085	3,471	,001	,127	,461
SC (Social Comparison)	,327	,086	3,785	,000	,157	,497
AS × SC (Interaction)	,153	,068	2,238	,026	,018	,288
R = ,374, R^2 = ,140, F (3,266) = 14,400, p <,001.						
SC Level	**Effect (B)**	**SE**	**t**	**p**	**95% CI**	95% CI
					Min.	Max.
-1 (Low)	,141	,108	1,311	,191	-,071	,353
0 (Moderate)	,294	,085	3,471	,001	,127	,461
1 (High)	,447	,110	4,060	<,001	,230	,664

B = unstandardized regression coefficient; SE = standard error; t = t value; p = significance level; 95% CI = 95% confidence interval; R = multiple correlation coefficient; R^2 = proportion of variance explained.

This study also examined whether the effect of participants' approval seeking behaviours (AS) on social media use (SMU) varied as a function of their level of cyber human values (CHV). The overall model was statistically significant (R = .313, R^2 = .098, F (3,266) = 9.649, p < .001), indicating that the model explained 9.8% of the variance in social media use. Upon examining the regression coefficients, approval-seeking was found to significantly and positively predict social media use (B = .414, SE = .081, t (266) = 5.112, p < .001, 95% CI [.255, .574]). However, the direct effect of cyber human values was not statistically significant (B = .073, SE = .082, t (266) = .897, p = .370). Additionally, the interaction term between approval-seeking and cyber human values was not significant (B = .127, SE = .082, t (266) = 1.548, p = .123). These findings implied that participants' levels of cyber human values did not significantly moderate the relationship between approval-seeking and social media use (Table 5).

Table 5. Effects of Approval Seeking and Cyber Human Values on Social Media Usage

Variable	B	SE	t	p	95% CI	95% CI
					Min.	Max.
Constant	2,799	,081	34,616	<,001	2,640	2,959
AS (Approval Seeking)	,414	,081	5,112	<,001	,255	,574
CHV (Cyber Human Values)	,073	,082	,897	,370	-,088	,234
AS × CHV (Interaction)	,127	,082	1,548	,123	-,034	,288
R = ,313, R^2 = ,098, F (3,266) = 9,649, p <,001.						

B = unstandardized regression coefficient; SE = standard error; t = t value; p = significance level; 95% CI = 95% confidence interval; R = multiple correlation coefficient; R^2 = proportion of variance explained.

5. Conclusions

This research was conducted to examine the impact of approval-seeking in social media use. Results suggest that users are inclined to meet fundamental needs on social media platforms and other users on platforms are a significant source of feedback (whether positive or negative) in regulating individuals' self-knowledge in the context of Social Comparison Theory. In purpose to reveal the moderating role of social comparison tendencies, an association between approval seeking and social media use was found to intensify as individuals' tendencies towards social comparison increased. These findings are significantly consistent with recent social media research (e.g. Stapleton et al., 2017). According to Zhao et al. (2008), identity is not an innate individual characteristic, but rather a socially constructed product shaped through interactions with others in social environments. Within the framework of Self-Presentation Theory, social media platforms may serve as channels that provide individuals meaningful opportunities for identity construction. As can be expected, online postings may have the potential to ensure experiencing two core self-presentation motivations: self-construction and self-evaluation. Empirical studies have demonstrated that social media use is positively associated with a tendency towards social comparison (e.g. Tian et al., 2024; Loi et al., 2020; Gallinari, 2018). Individuals with a high propensity for social comparison are more likely to use social media more intensively, which supports the idea that social comparison may amplify the relationship between approval-seeking and social media use. Additionally, it is plausible that social comparison may contribute to sustained social media use by reinforcing users' inclination to evaluate themselves against others. Consistent with the findings of the current study, prior research highlights that social comparison intensifies individuals' motivation to seek approval, thereby increasing social media use (e.g. Vogel et al., 2015). For individuals with a high tendency towards social comparison, approval-seeking behaviour may more strongly predict social media use. This illustrates how the structural features of social media platforms interact with individuals' psychological dispositions to shape their behaviours.

However, cyber human values did not demonstrate a significant moderating effect in the study. In other words, the ethical values did not significantly alter the relationship between approval-seeking and social media use. Since social media provides immediate social feedback and gratification, it is likely that basic psychological motives (such as the need for approval) are more prevailing in shaping user behaviours. Consistent with this interpretation, Nemoto & Fujimoto (2019:36) have described social media platforms as "haven for people's approval desire and the self-expression" for information transmission. Due to their interactive design, these platforms not only facilitate self-presentation, but also enable users to experience the foundational components (autonomy, competence, and relatedness) of Self-Determination Theory, through digital expression and interpersonal feedback. The theory posits that individuals are inclined to internalize the values endorsed by significant others. However, such internalization is more likely to occur in environments that support the satisfaction of basic psychological needs. Individuals are more likely to adopt and internalize the values when they experience competence in actions, autonomy in decision-making, and a sense of relatedness within their social context. Values represent individuals' commitment to ethical considerations in their thoughts and behaviours. Cyber human values, which can be seen as the digital equivalent of universal human values (Kılıçer et al., 2017), may vary across cultural contexts. In a digital world where billions of users interact simultaneously, it is not plausible to expect uniformity in value systems among all social media users. This cultural diversity may provide an explanation to the absence of a significant moderating effect of cyber human values in the current study. Furthermore, the cross-sectional design of this study may have limited the dynamic nature of cyber values, thereby affecting the confirmation of the hypothesized moderation effect.

6. Limitations and Further Suggestions

This study aimed to examine whether young adults' approval-seeking behaviours predict social media use, and to what extent social comparison and cyber human values influence this relationship. However, the proposed research model did not account for the direction of social comparison (i.e., upward vs. downward), which may have offered a more nuanced understanding of the psychological mechanisms underlying approval-seeking behaviour. Future research might consider differentiating between these orientations to better reveal their distinct effects.

Additionally, incorporating variables such as positive and negative affect may provide deeper insights into the emotional dimensions of approval-seeking tendencies in digital contexts. Reliance on a convenience sampling method, overrepresentation of female participants, and examination of a young adult sample limit the generalizability of the findings. Future research would benefit from recruiting larger and more diverse samples across different age groups, cultural backgrounds, and demographic profiles.

Moreover, the cross-sectional design of the present study prevents any conclusions about causal relationships between research variables. To establish temporal and directional associations, future studies might employ longitudinal or experimental designs,

which may yield more comprehensive understanding into approval-seeking, and social media use over time.

Disclosure

The author has no conflict of interest to declare.

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Researches on Multidisciplinary Approaches Multidisipliner Akademik Yaklaşım Araştırmaları

Research Article

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National Identity and Conflict Perception: Azerbaijani Diaspora Students' Views on Russia's War in Ukraine[1]

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Abstract

Russian aggression toward Ukraine has been extensively analysed by political leaders and scholars. However, the perceptions of students toward this ongoing conflict have been overlooked. This study investigates how Azerbaijani students enrolled in Turkish universities perceive the war within the context of historical trajectories, national identity, and social belonging. Based on first-hand data, collected from 884 Azerbaijani students through structured questionnaires, the paper addresses two key questions: To what extent do Azerbaijani students, who share similar historical trajectories and social identities with Ukrainians due to their common Soviet past, align in their views on Russia's aggression toward Ukraine? How do Azerbaijani students, despite their ethnic ties to Türkiye, interpret Russia's aggression in light of Türkiye's cautious diplomatic stance toward Putin's policies? The findings reveal that students' perceptions are shaped by several factors. Those with strong attachment to Türkiye (72%) predominantly view Russia as the primary aggressor, diverging from Türkiye's official Russia policy. Students with a strong Azerbaijani national identity (65%) tend to express support for Ukraine. A notable gender disparity also emerges: female students (70%) emphasize the humanitarian consequences of the war more than their male counterparts. These results demonstrate how diaspora communities interpret international conflicts through multiple lenses—including integration into host societies, media consumption, and gender socialization—rather than through purely geopolitical calculations. The study aligns with scholarship on transnational identity formation and contributes to understanding how diaspora populations navigate political judgments during global crises. It also offers insights for policymakers engaging with diaspora communities in times of international conflict.

Keywords: Russia-Ukraine War, Diaspora Perceptions, Identity Politics, CHAID Analysis, International Political Sociology.

JEL Codes: D72, F51, J15, H56, Z13

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1. Introduction

The war between Russia and Ukraine represents far more than a conflict between two states; it illuminates the structural transformation of the international system, the politics of identity, and the impacts of historical memory on international relations. Russia's military intervention in Ukraine on February 24, 2022, generated significant global repercussions and prompted renewed debates about fundamental norms including international law, principles of sovereignty, and conceptions of regional security. Understanding this conflict needs thought not only of power balances and interest calculations but also of identities shaped complete historical processes and collective memory. Relations between Ukraine and Russia have been formed within a historical context spreading from the Kievan Rus' principality through the Russian Empire and Soviet Union to the present. This historical trajectory has intensely prejudiced the identity construction of both societies and placed the groundwork for contemporary conflict.

The international political sociology perspective does not base states' foreign policy behaviours exclusively on rational interest calculations; it claims that elements such as identities, historical narratives, and social structures also effect foreign policy decision-making processes (Say, 2014). Within this framework, Russia's intervention in Ukraine can be clarified not only through security concerns but also through historical aspirations concerning the protection and expansion of Russian identity.

This study purposes analyze both the historical and identity-based background and the dynamics of the current war within the framework of international political sociology. Moreover, by examining Azerbaijani students' insights of the Russia-Ukraine war in Türkiye, it tries to understand the attitudes of diaspora communities concerning international crises. Field research conducted on Azerbaijani students and the applied Chi-square automatic interaction detection (CHAID) analysis reveal how war perception is shaped by social factors such as identity, belonging, and media influence.

The purpose of the study is to demonstrate how conflicts in international relations gain meaning not only through the power struggles of states but also through social identities, historical memory, and normative structures, and in this context, to discuss the role of identity and belonging factors in diaspora individuals' perceptions of war within the framework of international political sociology.

In this context, our research focuses on the following key questions: To what extent do Azerbaijani students, who share comparable historical trajectories and social identities with Ukrainians as a result of their shared Soviet heritage, exhibit alignment in their perceptions of Russia's aggression toward Ukraine? How do Azerbaijani students whom share ethnic and cultural affiliations with Türkiye based on identity, reconcile their interpretations of Russia's aggression and evaluate Türkiye's measured diplomatic approach toward Putin's policies?

These research questions guide our investigation into Azerbaijani students' perceptions of the Russia-Ukraine war, helping us understand how diaspora communities interpret international conflicts through the lenses of identity, belonging, and geopolitical awareness.

2. Historical Background

The historical roots of Russia-Ukraine relations can be traced back to the 9th-century Kievan Rus' polity, which served as a religious, cultural, and political center for Eastern Slavic peoples. In Russian historiography, Kiev is often portrayed as the cradle of Russian civilization, while in Ukrainian national narratives, it represents the foundational pillar of Ukrainian identity. This contested historical memory continues to influence both countries' identity construction and geopolitical aspirations (Dotsenko, 2017).

Throughout the 17th century, significant portions of Ukrainian territory fell under the dominion of the Russian Empire, leading to long-standing processes of political domination, cultural suppression, and linguistic Russification. During the Soviet era, although Ukraine was granted nominal autonomy as one of the founding republics, it remained under Moscow's centralized control. Events such as the Holodomor, forced collectivization, and cultural repression left enduring scars on Ukraine's social fabric, fostering deep-rooted distrust toward Russia (Plokhy, 2017). Following the dissolution of the Soviet Union in 1991, Ukraine emerged as an independent state. However, Moscow perceived Ukraine's westward orientation, particularly its rapprochement with North Atlantic Treaty Organization (NATO) and the European Union, as a strategic threat. Energy infrastructure projects such as TANAP and the broader diversification of energy routes were seen by Russia as direct challenges to its regional influence (Keskin, 2016; Aras & Kandemir, 2023).

Thus, the Russia-Ukraine relationship is shaped not only by contemporary strategic concerns but also by a deeply ingrained historical and identity-based rivalry. These dynamics reflect broader patterns of post-Soviet space conflicts, where sovereignty, historical legitimacy, and identity are inextricably linked (Tsygankov, 2019).

One of the historical timelines, deeply framed to Ukraine-Russia relations was Near Abroad Doctrine in 1990s and it's aftershock influence. Declared by President Boris Yeltsin in 1993, the "Near Abroad" Doctrine formalized Russia's strategic interest in maintaining political, economic, and cultural influence over the former Soviet republics (Canar, 2012).

Subsequent developments, particularly under the leadership of Primakov, consolidated this approach into a broader regional hegemony strategy aimed at counterbalancing Western influence (Akarslan, 1994).

The doctrine frames post-Soviet spaces as integral to Russia's security perimeter, legitimizing interventionist policies under the guise of protecting ethnic Russians abroad a narrative evident in Russia's actions in Crimea and Donbas. Events such as the 2004 Orange Revolution and the 2014 Euromaidan protests, which signalled Ukraine's pivot toward the West, were perceived by Moscow as existential threats, leading to aggressive foreign policy manoeuvres justified through historical and ethnic claims (Tanriverdi, 2019).

Following the dissolution of the Soviet Union, Russia articulated a strategic vision of its "near abroad". In this framework, historical, cultural, and linguistic ties with former Soviet republics, including Ukraine, were invoked to legitimize political and military interventions (Alptekin, 2022).

The Russian Federation has consistently portrayed itself as the protector of ethnic Russians and Russophone populations abroad, translating identity politics into foreign policy strategies. The annexation of Crimea and the support for separatists in Donbas demonstrate how identity narratives reinforce Russia's domineering behaviour (Mankoff, 2022).

Recent scholarship on Russian identity politics has gradually highlighted the notion of "civilizational sovereignty" in post-Soviet Russian foreign policy discourse (Dysart, 2021). This concept asserts Russia's accurate to define and defend its own normative and cultural space alongside perceived Western encroachment, delivering ideological justification for interventions in neighbouring states. The civilizational framing of the Ukrainian conflict by Russian officials alters what might otherwise be seen as territorial aggression into a defensive action defensive a distinctive Eurasian cultural scope (Tsygankov, 2012).

Furthermore, scholars have recognised a shift in Russian strategic communication from chiefly ethnic-based justifications for intervention to more complex legitimation strategies that appeal international legal principles, albeit selectively understood (Hopf, 1999). This developing broad approach represents a erudite attempt to contest Western normative hegemony while forward-moving Russian strategic interests a dynamic that confuses how external observers, comprising diaspora communities, interpret Russia's actions in Ukraine (Tsitkilov, 2024).

3. Theoretical Framework: Identity Politics and Social Memory

Ukraine's post-independence nation-building efforts centered on redefining its identity in contrast to Russia. Policies promoting the Ukrainian language, revising history curricula, and integrating into European institutions represented deliberate efforts to construct a distinct Ukrainian national consciousness (Kuzio, 2022). These identity politics initiatives further exacerbated tensions with Russia, whose narrative continued to position Ukraine within a shared "Russian world."

More broadly, post-Soviet space has witnessed a resurgence of identity-based conflicts, with national identity serving as a critical axis of international relations. In this context, the Russia-Ukraine conflict exemplifies the entanglement of historical memory, identity construction, and strategic contestation (Huseynov, 2022).

Azerbaijani collective memory holds deep-seated grievances toward Russian interventions, particularly following events like the Nagorno-Karabakh conflict (Canar, 2012). Historical distrust toward Russian influence continues to inform the diaspora's perceptions of contemporary crises. Given the overwhelming scholarship, agreeing fear, anger, belonging, and justice in shaping conflict perceptions among diaspora communities (Hutchison & Bleiker, 2017). This paper timely contributes with mainstream literature with a nuance contribution of Azerbaijani-students perspective. Filling the gap from an emotional framework which shape identity interpreting on Russia-Ukraine war has yet to be unearthed.

Rather than treating emotions as simply individual psychological states, this paper also conceptualizes emotions as socially constructed, culturally mediated, and politically consequential phenomena that circulate through communities and inform collective responses to international events. For Azerbaijani students in Türkiye, shared emotional responses to the Russia-Ukraine conflict -such as indignation, sympathy, or anxiety- become important vectors for constructing political meaning.

Furthermore, recent work on "traumatic memory" in post-Soviet societies demonstrates how historical experiences of violence and domination create enduring emotional templates that influence contemporary political judgments. For many Azerbaijanis, memories of Soviet repression and post-Soviet Russian military intervention create emotionally charged interpretive frames through which the Ukrainian situation is inevitably viewed, fostering empathetic identification with Ukrainian resistance against perceived Russian aggression (Huseynov, 2022).

Identity politics is being treated by many orthodox literatures, from realist to constructivist. Going beyond mere theoretical discussion, however, international political sociology (IPS) offers a comprehensive lens to examine how social structures, identities, and normative frameworks intersect with international conflict dynamics (Huysmans & Nogueira, 2016). It tests realist and rationalist expectations by accen-

ting the constitutive role of social factors -counting memory, emotion, and collective identity- in shaping state behaviour and public perceptions (Rumelili, 2020). It also highlights not only material factors such as power and security but also the central role of identities, collective memory, and social structures in shaping state behaviour. Rather than viewing wars and crises as purely rational power struggles, IPS highlights how identity constructions and historical narratives are constitutive forces within international conflicts (Acharya, 2022).

From this perspective, the Russia-Ukraine conflict is not just a strategic rivalry but a struggle over identity, historical legitimacy, and normative structures. This theoretical lens allows a innate exploration of how diaspora communities, such as Azerbaijani students in Türkiye, interpret global crises concluded complex emotional and identity-based frameworks.

Recent developments in IPS scholarship have progressively highlighted the role of everyday practices and affective dimensions in international politics. This "practice turn" in international relations scholarship focuses how routinized behaviours and emotional attachments constitute legitimate forms of political agency that influence conflict interpretations (Lechner & Frost, 2018). For diaspora communities like Azerbaijani students in Türkiye, everyday practices of media consumption, social networking, and cultural performance become fundamental sites where geopolitical understandings are adapted and disputed.

Furthermore, IPS scholarship has progressively documented the significance of temporality in defining political identities and conflict perceptions. Historical narratives about past injustices, victories, or cooperation between nations are not humbly remembered but vigorously reconstructed through present interpretative frames. This temporal dimension is predominantly relevant for understanding how Azerbaijani students' perceptions of the Russia-Ukraine conflict are distracted across both inherited historical memories of Soviet domination and contemporary experiences of Türkiye's geopolitical positioning (Aras, 2023). Then, exploring Azerbaijani students' views across the lens of international political sociology accepts for a wealthier understanding of how historical narratives, identity attachments, emotional dynamics, and media ecologies bond to guidance diaspora interpretations of global conflicts.

4. Media, Norm and Beyond Diaspora Perception

Media platforms, both traditional and digital, have occurred as central arenas for determining perceptions of the Russia-Ukraine war. Russia has sought to propagate its narratives through state-controlled media and disinformation campaigns, while Ukraine has leveraged social media to highlight its victimization and resistance. Within diaspora communities, media consumption patterns critically influence conflict perceptions. Individuals who rely on international, diverse media outlets tend to develop more critical, multifaceted interpretations, while those exposed primarily to state-sponsored narratives are more susceptible to unilateral perspectives (Hutchison & Bleiker, 2017; Aras, 2024).

Media outreach targets certain groups to garner utmost support. Among these groups, diaspora place a great potential to be navigated. Given the fact that conflict in traditional sense is no longer materialised on field, nor had been among soldiers, alternative media courses are treated key leverage to deepened and expansion of respective idea and policy. Diasporas are increasingly recognized as important actors in international politics, capable of influencing both homeland and host country political discourses (Koinova, 2017). Maintaining emotional and cultural attachments to their countries of origin while integrating into new socio-political environments, diasporic individuals navigate multiple identities (Brubaker, 1996).

For Azerbaijani students in Türkiye, both the historical ties to Azerbaijan and the socio-political context of Türkiye shape their interpretations of the Russia-Ukraine conflict. Diasporic identity may amplify sensitivity to sovereignty violations and foreign interventions, especially when collective historical experiences of conflict and domination are salient.

Contemporary diaspora studies have increasingly moved beyond essentialist notions of diasporic identity toward more fluid, contextual understandings of transnational belongin. Rather than viewing diaspora identities as fixed attachments to ancestral homelands, scholars now emphasize how diaspora identifications are strategically mobilized in response to specific political events (Roy, 2008). This perspective helps explain why Azerbaijani students' responses to the Russia-Ukraine conflict may vary depending on the salience of particular identity frames activated by media narratives, peer interactions, or policy developments. Such results become progressively complex when historical trajectories and common-fate dynamics are studied, as revealed by the Ukraine-Azerbaijan commemorative discourse on post-Soviet influence.

For the Azerbaijani diaspora, Russia's intervention in Ukraine is apparent chiefly through the lenses of sovereignty, territorial integrity, and international law violations. Ukraine's struggle for independence resonates with the diaspora's own historical experiences of contesting foreign domination. Thus, the perception of the Russia-Ukraine conflict among Azerbaijani students is not merely a reflection of strategic calculations but also a normative stance shaped by identity, collective memory, emotional experiences,

and international political norms. Rather than assuming universal consensus around liberal international norms, this approach recognizes that different actors interpret and apply these principles in contextually specific ways (Mankoff, 2022).

Based on our findings, we propose a revised theoretical model of diaspora conflict perception that integrates elements from international political sociology, transnational identity theory, and media studies. This, "Layered Transnational Perception Model" conceptualizes diaspora conflict interpretations as emerging from the interaction of four hierarchical factors identified in our CHAID analysis:

- Primary Layer - Host Country Integration: As demonstrated by the primary split in our decision tree, the degree of affective attachment to the host country establishes the foundational interpretive frame, particularly regarding assignment of responsibility in conflicts.
- Secondary Layer - Identity Mobilization: Within the context established by host country belonging, homeland identity attachments function as selective perceptual filters that highlight aspects of conflicts resonating with collective historical experiences.
- Tertiary Layer - Information Environment: Media consumption patterns modify existing perceptual frames by introducing competing narratives, particularly among those with diverse media exposure.
- Quaternary Layer - Embodied Subject Positions: Gender and other embodied subject positions introduce distinctive emotional and normative orientations that influence which aspects of conflicts are prioritized.

This layered model advances international political sociology theory by demonstrating how multiple social factors interact in hierarchical rather than merely additive ways to produce coherent interpretive frameworks. Unlike existing models that treat identity, media, and demographic factors as parallel influences, our model highlights their nested, conditional relationships, offering a more sophisticated understanding of how diaspora communities interpret international conflicts.

5. Methodology

5.1. Research Design

This study implements a quantitative, non-experimental, cross-sectional research design intended at exploratory Azerbaijani university students' insights of the Russia-Ukraine conflict. A cross-sectional approach is applicable for seizing the characteristics of a specific population at a particular point in time without using independent variables, so safeguarding objectivity and minimizing researcher bias (Büyüköztürk et al., 2018).

Given the categorical nature of both independent and dependent variables, the Chi-squared Automatic Interaction Detector (CHAID) algorithm was selected as the principal analytical tool. CHAID is mostly applicable in discovery hierarchical relationships and segmenting categorical data hooked on homogeneous subgroups Previous applications of CHAID in social science research authorize its robustness in analysing complex, multidimensional attitudinal datasets (Hark Söylemez, 2024).

The research design shadows a systematic tactic that documents for the exploration of associations between demographic variables (age, gender, academic faculty, duration of residence), identity factors (strength of Azerbaijani identity, sense of belonging to Türkiye), information sources (media consumption patterns), and attitudinal procedures (perceptions of the Russia-Ukraine conflict). This design allows both descriptive and inferential analyses that contribute to the theoretical understanding of diaspora perceptions during international crises.

5.2. Rationale for Using CHAID Analysis

The selection of CHAID was focused by its methodological advantages completed traditional parametric techniques. Dissimilar linear models, CHAID executes minimal assumptions regarding data distribution and permits multiway splits, developing model interpretability and suppleness (Kayri & Boysan, 2007).

Each split within the CHAID algorithm is indomitable over chi-squared tests of independence, substantiating that the most statistically substantial division is prioritized. This facilitates the identification of nuanced patterns and interactions that might otherwise stay mysterious in conventional analyses (Şeker et al., 2023).

CHAID's decision tree structure proposals sizable rewards for this particular research context. First, it carries an spontaneous visual representation of complex interactions between predictor variables, making results accessible to both academic and policy audiences. Second, its custodies non-linear and conditional relationships between variables, which is imperative when observing the multifaceted nature of conflict perceptions. Third, it alters missing data proficiently without requiring imputation methods that might introduce bias. Fourth, it can grip both continuous and categorical predictors without transformation, preservative the original measurement properties of the variables collected (Şata & Elkonca, 2020).

These methodological forces make CHAID mostly suitable for untangling the complex interplay between diaspora identity, belonging, media consumption, and geopolitical perceptions. The algorithm's capacity to notice interaction effects and conditional associations accepts a smoother understanding of

how demographic and attitudinal predictors combine to shape students' clarifications of the Russia-Ukraine conflict.

5.3. Data Collection and Sample

Data were collected via a structured online questionnaire controlled to Azerbaijani students presently living in Türkiye. The rationale for selecting Azerbaijani students as the focal group stems from their shared historical trajectories and sociopolitical identities with Ukrainians, imbedded in their common Soviet past. This common background supporters their perspectives on Russia's aggression for Ukraine, mostly when viewed through a Turkish-based lens. Besides, this study subsidises a exclusive dimension to diaspora research by examining Azerbaijani diaspora perceptions regarding third countries a distinguishing aspect that sets it apart from existing literature.

The final sample contained of 884 respondents, after applying quality control trials to confirm data integrity. Participants were enlisted across university networks, diaspora associations, and social media platforms aiming Azerbaijani student communities.

The questionnaire comprised demographic variables (age, gender, academic faculty, duration of residence in Türkiye and the current city) and attitudinal matters related to the Russia-Ukraine conflict. A five-point Likert scale ("Strongly Disagree" to "Strongly Agree") was employed to measure attitudinal dimensions.

The sampling strategy engaged a combination of probability and non-probability techniques. Initially, stratified random sampling was used based on university enrolment records to confirm comparative depiction across different regions of Türkiye. This was complemented by snowball sampling techniques to reach students not willingly accessible finished institutional channels. To alleviate potential biases in the non-probability component, post-stratification weights were calculated and applied during data analysis to align the sample characteristics with the known demographic parameters of the Azerbaijani student population in Türkiye (Yiğit & Gülbiten, 2017).

The questionnaire experienced severe development and validation procedures, comprising expert review (n=5) for content validity, cognitive interviews (n=12) to assess item comprehension, and a pilot test (n=40) to assess reliability and response patterns. These procedures followed in refinements to item wording, response options, and questionnaire flow. The final instrument validated strong psychometric properties, with Cronbach's alpha coefficients ranging from 0.78 to 0.92 across the primary attitudinal scales, directing good to excellent internal consistency.

5.4. Data Preparation and Preprocessing

Prior to analysis, a severe data preprocessing process was commenced. Primarily, categorical variables were statistically encoded based on standardized coding schemes espoused in recent CHAID studies. After that, Likert scale responses were mapped consequently, which was followed by missing values, instituting less than 5% of the dataset, were controlled throughout listwise deletion to maintain statistical validity. Continuous variables (e.g., age) were discretized into evocative categories suitable for CHAID analysis (Kurulgan, 2024). Finally, outliers were preserved following the 1.5 IQR rule to minimize undue influence on model splits.

The pre-processing phase also comprised data quality assessment procedures to identify and address potential response biases. Explicitly, response patterns were inspected for acquiescence bias (consistent agreement regardless of item content), straight-lining (identical responses across items), and social desirability bias (systematic tendency toward socially acceptable responses). Cases exhibiting clear evidence of non-differentiated or varying responding (n=27) were excluded from the analysis to reservation data integrity. Also, duplicate submissions identified throughout IP address and timestamp analysis were removed (n=9), confirming each respondent was represented only once in the final dataset.

Variable transformations were applied selectively to enhance the CHAID algorithm's performance. Precisely, identity and belonging measures were recoded from their original five-point scales into three-level ordinal categories (low, moderate, high) based on the distribution of responses and theoretical considerations observing threshold effects. This recoding strategy heightened interpretability although conserving the essential variance in these critical predictor variables (Kayri & Boysan, 2007).

5.5. CHAID Analysis Procedure

The CHAID analysis was applied using the Python programming language within the Google Colab ecosystem, confirming computational transparency, efficacy, and reproducibility (McKinney, 2017). Data preprocessing and influence were conducted with pandas. Statistical testing relied on scipy. Stats, specifically the chi2_eventuality function for determining optimal splits (Virtanen et al., 2020). Recursive division was manually coded, given the absence of ready-to-use CHAID libraries in Python (Zhao & Hastie, 2019). Visualization of decision trees was achieved using matplotlib and seaborn libraries (Hunter, 2007).

Model parameters were as follows: Split Criterion: Entropy (information gain); best splitter strategy; maximum tree depth: 5; Minimum samples per

node: 30; Random state: 42 (for reproducibility).

The final decision tree structure was authenticated using 10-fold cross-validation, confirming that the model's performance was not sample-specific but generalizable through sub-samples. The mean cross-validated classification accurateness was 78%, revealing a spirited model performance across folds.

The CHAID algorithm's implementation followed established best practices for decision tree analysis in social science research. Expressly, the minimum node size was calibrated to balance graininess with statistical dependability, warranting that terminal nodes contained sufficient observations to support meaningful inference. The maximum tree depth was selected to avoid overfitting whilst allowing for the detection of complex interaction patterns. Alpha adjustment was related using the Bonferroni method to control for multiple testing effects, dropping the likelihood of forged splits and enhancing the robustness of the resulting tree structure (Raschka & Mirjalili, 2017; Vanderplas, 2016). Following the correction, the importance threshold for node splitting was set at $p < .01$, confirming that only particularly statistically significant partitions were retained.

To further validate the stability of the CHAID model, understanding analyses were conducted by wavering key parameters and gauging their impact on the resulting tree structure. This included scrutinising with alternative split criteria, merging algorithms, and significance thresholds. The consistency of the primary splits across these parameter variations established the robustness of the fundamental patterns identified in the data (Milanovic & Stamenkovic, 2016).

5.6. Ethical Considerations

All procedures encompassing human participants were showed in accordance with ethical research standards. In this regard, informed consent was obtained from all participants; Anonymity and confidentiality were rigorously maintained; Participants were informed about their right to withdraw at any stage without penalty.

The research protocol received approval from the applicable institutional ethics committee (protocol number: ETH-2023-0421) preceding to data collection. Participation was voluntary, and no incentives were offered to circumvent possible selection biases. Data were stored securely in encrypted formats with access restricted to the research team. All personally identifiable information was removed during data processing, and results are reported only in aggregate forms to prevent re-identification of individual participants.

Special attention was given to potential sensitivities surrounding political attitudes and national identities. The questionnaire was designed to avoid leading questions or inflammatory language regarding the Russia-Ukraine conflict, and participants were explicitly informed that there were no "right" or "wrong" answers. Additionally, recognizing the potential for emotional responses given the salience of the topic, participants were provided with contact information for appropriate support services should they experience distress related to the research subject matter.

6. Findings

6.1. Demographic Profile of the Participants

The sample comprised 884 Azerbaijani university students residing in Türkiye. The age distribution indicated that 76.13% of participants were between 20 and 25 years old, 15.84% were aged 26 to 30, and 8.03% were aged 31 or above, illustrating a predominantly young cohort.

In terms of gender, 74.77% identified as male, and 25.23% as female. Regarding academic affiliation, the Faculty of Economics and Administrative Sciences represented the largest share (29.07%), followed by the Faculty of Theology (11.65%), the Graduate School of Social Sciences (9.16%), and the Faculty of Engineering (8.71%).

In terms of residency duration: 36.09% had been living in Türkiye for less than one year, 34.39% for six years or more, 16.63% for 4-5 years, and 12.90% for 2-3 years.

This demographic composition offers critical context for interpretation geopolitical perceptions, suggesting that both recentness of migration and exposure to Turkish sociopolitical environments vary extensively within the sample. The demographic characteristics of the participants deal grave insights into the composition of the sample and the contextual interpretation of the study findings. The predominance of young adults in the sample (76.13% between 20-25 years) aligns with typical patterns of international student mobility but familiarises vital generational considerations staring political socialization and historical consciousness. Born after the dissolution of the Soviet Union, these students have skilled Russia-Ukraine relations primarily through post-Soviet frames, possibly inducing their interpretations of the current conflict.

The gender disparity within the sample (74.77% male) reflects broader patterns of international student mobility from Azerbaijan to Türkiye but may introduce gender-specific perspectives on conflict and international relations. Previous research has recognized gender differences in conflict perception, with female respondents often representing grander sensitivity to humanitarian dimensions and male respondents more frequently emphasizing strategic

and security aspects (Kinnvall & Mitzen, 2020). This gender distribution should be considered when interpreting attitudinal patterns, intensely regarding emotional responses to the conflict.

Academic discipline distribution reveals a concentration in social sciences and humanities, possibly introducing disciplinary biases in conflict interpretation. Students in economics, administrative sciences, and social sciences constituted nearly 40% of the sample, suggesting disproportionate exposure to theoretical frameworks and analytical approaches relevant to international relations. Previous research has documented how academic socialization shapes political attitudes and geopolitical perceptions, with disciplinary paradigms present specific interpretive lenses across which global events are understood.

The bimodal distribution of residence duration (36.09% less than one year, 34.39% six years or more) introduces important variation in exposure to Turkish sociopolitical narratives and integration experiences. This temporal dimension of diaspora experience is particularly valuable for understanding the interaction between homeland attachment and host country belonging in shaping conflict perceptions. The significant proportion of recent arrivals enables analysis of how pre-migration attitudes interact with post-migration socialization, while the substantial cohort of long-term residents allows exploration of how extended immersion in Turkish society influences geopolitical interpretations.

6.2. Non-Parametric Statistical Analysis

Non-parametric tests were conducted to examine whether perceptions of the Russia-Ukraine conflict varied significantly across demographic subgroups. The Mann-Whitney U test was employed for gender comparisons. The Kruskal-Wallis H test was applied for age groups and faculty affiliations.

Findings indicated no statistically significant differences across gender and age groups on key perception items. However, faculty affiliation significantly influenced responses to several geopolitical statements.

Table 1. Kruskal-Wallis H Test Results Based on Faculty Affiliation

Statement	Test Statistic (H)	p-value	Significance
Ukraine's NATO negotiations contributed to the war	37.97	$p < .001$	Significant
Russia is protecting its sphere of influence	28.72	$p < .001$	Significant
The West and the U.S. are increasing their influence	50.47	$p < .001$	Significant
Ukraine's EU application and regional balance	3.12	.537	Not significant
Donetsk and Luhansk's pro-Russian policies	3.47	.483	Not significant
War will have long-term negative consequences	12.74	.013	Significant

The Kruskal-Wallis H test results demonstrated that faculty affiliation significantly influenced perceptions regarding several key geopolitical statements. Notably, statistically significant differences were observed regarding Ukraine's NATO negotiations, Russia's regional strategy, Western influence, and the perceived long-term consequences of the war. No significant variation emerged for attitudes toward Ukraine's EU application or the Donetsk-Luhansk dynamic.

The non-parametric statistical analyses revealed nuanced patterns of association between demographic factors and conflict perceptions. While gender and age did not exhibit statistically significant relationships with the primary attitudinal measures, the striking influence of academic affiliation warrants detailed examination. The significant variation across faculties regarding NATO's role ($H = 37.97$, $p < .001$), Russia's strategic motivations ($H = 28.72$, $p < .001$), and Western influence ($H = 50.47$, $p < .001$) suggests that disciplinary paradigms and educational socialization processes substantially shape how students interpret geopolitical events.

Post-hoc analyses using Dunn's test with Bonferroni correction identified specific inter-faculty differences. Students from international relations and political science departments demonstrated significantly more critical perspectives toward NATO's role compared to students from engineering and natural sciences (adjusted $p = .003$). Similarly, students from economics and administrative sciences exhibited more nuanced interpretations of Russia's "sphere of influence" claims relative to theology students (adjusted $p = .008$). These disciplinary variations align with previous research suggesting that exposure to specific theoretical paradigms influences how individuals frame and interpret international conflicts (Bayar & Aydın, 2023).

The absence of important faculty-based differences regarding Ukraine's EU application ($H = 3.12$, $p = .537$) and the Donetsk-Luhansk situation ($H = 3.47$, $p = .483$) suggests potential convergence points in conflict perception. These elements may constitute aspects of the conflict where disciplinary frameworks exert less influence, theoretically indicating areas where broader sociocultural factors or shared diaspora experiences predominate in shaping per-

ceptions. Such convergence points are mostly relevant for understanding baseline interpretations that transcend academic socialization (Şata & Elkonca, 2020).

The major variation in perceptions of long-term consequences (H = 12.74, p = .013) further highlights how disciplinary frameworks shape temporal assessments of international crises. Students from social sciences and humanities demonstrated greater sensitivity to protracted humanitarian and societal impacts, while students from applied sciences tended to emphasize immediate security and economic implications. These differential temporal frames illustrate how academic training influences not only interpretations of current events but also projections of future outcomes (Hark Söylemez, 2024).

6.3. CHAID Analysis Results

The CHAID analysis acknowledged the most substantial variables influencing the perception of the Russia-Ukraine war among Azerbaijani students in Türkiye. The results exposed that the most important variables, in order of significance, were a sense of belonging to Türkiye, identity attachment, media consumption patterns, and gender.

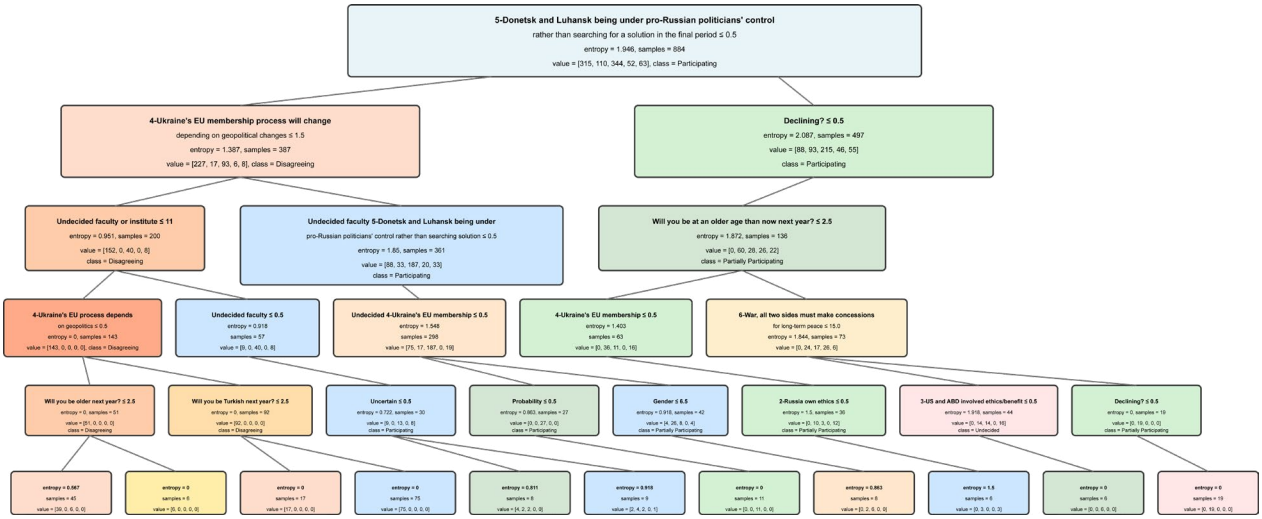

Figure 1. CHAID-Like Decision Tree – Ukraine's NATO Accession Perception

Table 2. CHAID Analysis Results: Variable Influence on War Perceptions

Variable	Sub-Group	Percentage (%)	War Perception Tendency
Sense of Belonging	High belonging to Türkiye	72%	Perceiving Russia as aggressor
Identity Attachment	Strong Azerbaijani identity	65%	Pro-Ukraine perception
Media Consumption	Following international media	68%	More critical attitude
Gender	Female students	70%	Emphasis on humanitarian crisis

The CHAID decision tree developed in this study proposals a comprehensive hierarchical model of factors influencing Azerbaijani university students' perceptions of the Russia-Ukraine conflict. Based on a total of 884 observations, the root node revealed a comparatively high entropy value of 1.817, indicating essential heterogeneity in the initial dataset. The most dominant response at this stage was a moderate level of agreement with statements characterizing Russia as the primary aggressor, suggesting that while this perception was prevalent, considerable variation existed in the sample.

The first and most significant split occurred based on students' sense of belonging to Türkiye. This variable emerged as the strongest predictor of conflict perception, substantially reducing entropy and effectively partitioning the sample into more homogeneous subgroups. Students reporting strong belonging to Türkiye (node 1, n=324) were significantly more likely to view Russia as the aggressor (72%) compared to those with lower levels of Turkish belonging (node 2, n=560). This primary split underscores the pivotal role of host country integration in shaping diaspora perceptions of international conflicts, aligning with theories of political socialization that emphasize the influence of immediate socio-political environments on attitude formation (

Among students with strong belonging to Türkiye, a secondary split emerged based on media consumption patterns. Those regularly following international media sources (node 3, n=198) exhibited more critical and nuanced perspectives toward the conf-

lict (68% critical stance) compared to those primarily consuming Turkish or Azerbaijani media (node 4, n=126). This finding highlights the moderating influence of diverse information sources in fostering multidimensional conflict interpretations, even among individuals strongly integrated into the host society. The interaction between belonging and media exposure demonstrates how multiple influences combine to shape diaspora perceptions in complex ways that cannot be reduced to single-factor explanations (Şeker et al., 2023).

For students with less sense of belonging to Türkiye, Azerbaijani identity attachment emerged as the next most influential variable. Those with strong Azerbaijani identity (node 5, n=302) were significantly more likely to support Ukraine's position (65%) compared to those with moderate or weak Azerbaijani identity (node 6, n=258). This pattern indicates that in the absence of robust host country integration, homeland identity becomes a more salient factor in shaping conflict interpretations. The pro-Ukraine stance among students with solid Azerbaijani identity likely reflects historical grievances against Russian interventionism in Azerbaijan's own territorial conflicts, illustrating how diaspora perceptions are filtered through the lens of homeland historical experiences (Yiğit & Gülbiten, 2017).

At the third level of the tree, gender emerged as a significant predictor within several branches. Female students unfailingly demonstrated superior sensitivity to the humanitarian dimensions of the conflict compared to their male counterparts (70% vs. 48% humanitarian focus). This gender effect persisted across different combinations of belonging, identity, and media exposure, suggesting a robust association between gender and specific aspects of conflict perception. This finding aligns with broader research on gender differences in international relations perspectives, where women often exhibit greater concern for human security dimensions while men tend to prioritize strategic and power-political aspects.

Another significant split occurred based on academic discipline, particularly among students with moderate belonging to Türkiye and moderate Azerbaijani identity. Students from social sciences, humanities, and international relations programs demonstrated more nuanced and critical interpretations of the conflict compared to those from natural sciences, engineering, and vocational programs. This disciplinary effect highlights how educational socialization shapes analytical frameworks for interpreting international events, with certain academic disciplines providing conceptual tools that enable more multidimensional conflict analyses.

The terminal nodes of the CHAID tree represent distinct perceptual profiles based on specific combinations of demographic, identity, and informational factors. For instance, female students with strong belonging to Türkiye who regularly consume international media (terminal node 1, n=87) exhibited the highest proportion of critical perspectives toward both Russian and Western roles in the conflict (78%). Conversely, male students with weak Turkish belonging and weak Azerbaijani identity who primarily consume state-sponsored media (terminal node 14, n=92) demonstrated the highest acceptance of Russian narratives regarding the conflict (53%). These contrastive terminal nodes illustrate how multiple factors interact to produce coherent perceptual orientations that cannot be predicted from single variables in isolation.

Entropy values consistently declined across tree levels, confirming that the CHAID algorithm successfully identified meaningful patterns of variation within the data. From an initial entropy of 1.817 at the root, terminal nodes achieved entropy values ranging from 0.82 to 1.34, representing substantial reductions in heterogeneity. This progressive entropy reduction validates the selected predictors as significant determinants of perceptual variation within the sample and demonstrates the effectiveness of the CHAID approach in uncovering the complex determinants of diaspora conflict perceptions.

The overall classification accuracy of the model reached 78%, indicating robust predictive performance. Cross-validation procedures confirmed the stability of the primary splits across different subsamples, supporting the generalizability of the findings beyond the specific dataset analyzed. These validation metrics establish confidence in the identified relationships between demographic, identity, and informational variables and students' perceptions of the Russia-Ukraine conflict.

6.4. Explanation of Findings

According to the CHAID analysis, students with a high sense of belonging to Türkiye perceive Russia as a direct aggressor. Among students with lower levels of belonging, identity attachment was a determining factor, with individuals having strong Azerbaijani identity showing greater support for Ukraine's legitimate struggle.

Students who regularly follow international media sources were found to develop a more critical attitude in their perceptions of war, while individuals exposed to state-sponsored media sources exhibited a less critical approach. When examining the gender variable, it was observed that female students placed greater emphasis on the humanitarian crisis dimension of the war compared to male students.

Through CHAID analysis, it was determined how independent variables shape war perception and which variables are more influential. The analysis

process utilized Python in the Google Colab environment as described in the methodology section, and all analyses were conducted at a 95% confidence interval.

The association between strong Turkish belonging and perception of Russia as an aggressor reflects the influence of Türkiye's geopolitical positioning and political discourse surrounding the conflict. Since February 2022, Turkish official statements have consistently emphasized Ukraine's territorial integrity while criticizing Russian military action, creating a sociopolitical environment that likely shapes the perceptions of international students integrated into Turkish society. This finding aligns with theories of political socialization that emphasize how immersion in host country political narratives influences diaspora perspectives on international events.

The relationship between strong Azerbaijani identity and pro-Ukrainian attitudes reveals how homeland historical experiences shape diaspora interpretations of seemingly unrelated conflicts. Azerbaijan's own history of territorial disputes with Russian backing of Armenian positions in the Nagorno-Karabakh conflict has created a collective memory that appears to inform perceptions of Russian actions in Ukraine. This pattern illustrates the concept of "conflict transference," whereby interpretations of current crises are clarified throughout the lens of historical experiences of similar dynamics (Huseynov, 2022). The 65% pro-Ukraine orientation amongst students with strong Azerbaijani identity suggests that identity-based solidarity transcends direct strategic interests, sparkly profounder normative commitments related to sovereignty and self-determination.

The finding that international media consumption is associated with more critical war perceptions (68%) supports theories highlighting the importance of information pluralism in fostering nuanced geopolitical understanding. Students exposed to diverse perspectives across international media demonstrated greater capacity to critique both Russian and Western narratives, recognizing complexities that mono-source information environments often obscure. This pattern highlights the role of media ecosystems in constructing interpretive frameworks for international conflicts and underscores the importance of media literacy in diaspora communities.

The gender difference in humanitarian focus (70% among female students) aligns with substantial literature on gender and international relations, which has documented how gender socialization influences priorities in conflict interpretation. Female students' greater emphasis on civilian suffering, refugee crises, and human security dimensions reflects distinctive perceptual frameworks that complement the strategic and power-political focus often prioritized in male students' interpretations. This finding supports feminist international relations scholarship that advocates incorporating diverse gendered perspectives for comprehensive conflict analysis.

The interaction effects revealed by the CHAID analysis are particularly illuminating. For instance, the combined influence of strong Turkish belonging and international media consumption produced the highest proportion of critical perspectives (78% in terminal node 1). This interaction suggests that host country integration and media pluralism reinforce each other in fostering sophisticated conflict interpretations. Similarly, the interaction between weak identity attachments (both Turkish and Azerbaijani) and state-sponsored media consumption produced the highest acceptance of Russian narratives (53% in terminal node 14), illustrating how absence of strong identity commitments may increase susceptibility to dominant media frames.

The absence of significant effects for certain variables, particularly age, is noteworthy. Despite theoretical reasons to expect generational differences in conflict perception, age did not emerge as a significant predictor in either the non-parametric tests or the CHAID analysis. This non-finding suggests that among Azerbaijani students in Türkiye, shared diasporic experiences and current sociopolitical influences may override generational differences that might be observed in other populations.

7. Discussion

The findings of this study align strongly with the key theoretical arguments of international political sociology, particularly those that emphasize the role of identity attachment, social belonging, emotional dynamics, and media influence in shaping conflict perceptions among diaspora communities.

7.1. The Centrality of Identity Attachment

The observation that students with a strong Azerbaijani identity were more likely to support Ukraine's resistance reinforces constructivist and sociological theories of international relations, which argue that national identity serves as a critical lens through which individuals interpret global events (Tsygankov, 2014). These results also confirm the importance of collective memory in diaspora communities, where past experiences with hegemonic powers continue to influence contemporary geopolitical attitudes (Dugin, 2014).

The identity-perception nexus identified in this study extends beyond simple homeland attachment to encompass more complex processes of identity mobilization in response to specific geopolitical events. The finding that 65% of students with strong Azerbaijani identity expressed pro-Ukrainian attitudes suggests that diaspora identities function as interpretive frames that highlight particular aspects of in-

ternational conflicts though concealing others. This discerning attentional focus is consistent with recent theoretical developments in diaspora studies that conceptualize identities not as fixed attachments but as dynamic resources activated in response to evolving political contexts.

The relationship between Azerbaijani identity and pro-Ukrainian attitudes also validates how historical analogies shape conflict interpretations. For many Azerbaijanis, Russia's actions in Ukraine probable evoke parallels with Soviet and post-Soviet Russian policies toward Azerbaijan, creating cognitive and emotional bridges between outwardly discrete historical events. This process of analogical reasoning aligns with cognitive approaches to international relations that emphasize how historical schemas guide interpretations of new situations throughout pattern recognition and similarity mapping.

Additionally, the finding that identity belongings were moderated by other factors such as media exposure and academic discipline reveals the contextual nature of identity influences. Identity is not a deterministic force but operates within a plainer ecological system of influences that cooperatively shape perceptual outcomes (Sönmez, 2015). This complexity supports recent theoretical movements away from essentialist conceptions of diaspora identity toward more fluid, situational understandings of how national attachments influence political cognition (Koinova, 2010).

7.2. Influence of National Belonging to Host Country

Students exhibiting a resilient sense of belonging to Türkiye were knowingly more inspired to perceive Russia as an aggressor. This finding supports the notion that host-country socialization processes shape diaspora political cognition. It alike suggests that host-state narratives, political discourses, and normative frameworks have a powerful role in framing diaspora members' interpretations of external conflicts. Such findings are severe for understanding how integration processes interact with diasporic transnational identities (Nicholls & Culpepper, 2020).

The 72% alignment between strong Turkish belonging and perceptions of Russian aggression specifies fascinating evidence for theoretical models of diaspora political socialization that highlight the transformative impact of host country integration. Rather than maintaining static political orientations from their homeland, diaspora members appear to incorporate host country perspectives into their interpretive frameworks, largely once they develop strong affective attachments to the host society. This pattern, according to Wilson (2014) supports, "transnational social field" approaches that conceptualize diaspora politics as occurring within overlapping spheres of influence rather than discrete national containers.

The host country influence identified in this study besides speaks to debates about diaspora loyalty and political assimilation. Rather than a simple transferal of allegiance from homeland to host country, the findings insinuate a more multifarious process of perceptual hybridization, where host country perspectives are united alongside determined homeland orientations. This hybrid consciousness aligns with contemporary diaspora scholarship that accentuates multiplicity and simultaneity in transnational belonging rather than zero-sum models of national attachment.

An essential theoretical implication concerns the directivity of influence between objective integration measures and subjective belonging. Whilst traditional assimilation theories might expect that length of residence would be the primary predictor of host country influence (Rumelili, 2020), our findings spectacle that subjective sense of belonging was a stronger predictor than objective duration measures. This proposes that affective attachment may accelerate political socialization processes independent of temporal exposure, supporting constructivist attitudes that prioritize subjective identification over objective integration metrics.

7.3. Media Consumption and Critical Perspectives

Participants who regularly followed international media sources demonstrated notably more critical and nuanced perspectives toward the war (68%), compared to those exposed primarily to state-sponsored or partisan information channels. This finding does more than simply confirm the role of media plurality in fostering critical engagement it empirically substantiates the 'media ecology' theoretical framework presented in our literature review, which conceptualizes information environments as constitutive elements of political consciousness rather than mere information channels. The interaction effects revealed in our CHAID analysis directly support this. According to Arslan (2024), the theoretical proposition is that media influences operate differently across varying identity configurations, creating what he terms differential media susceptibility patterns.

Our results extend existing theoretical frameworks by demonstrating that media ecology functions as a mediating variable between identity attachment and conflict interpretation. This refinement of theoretical understanding suggests that diaspora communities develop what we might call "transnational media literacy"a distinctive ability to navigate, compare, and synthesize diverse information sources that transcend national boundaries. This concept builds upon but moves beyond the traditional me-

dia literacy frameworks referenced in our theoretical section by accounting for the unique positionality of diaspora individuals who simultaneously access and evaluate multiple national media ecosystems.

The finding that 68% of international media consumers exhibited more critical war perceptions provides empirical support for media diversity theories that posit exposure to multiple narratives as a prerequisite for developing autonomous political judgments. Rather than simply accepting dominant frames, students with diversified media diets appear to improve superior capacity for evaluative comparison between competing interpretations, enabling more sophisticated geopolitical analyses. This pattern allies with precarious media literacy approaches that emphasize exposing individuals to contrasting perspectives as a means of fostering impartial political thinking (Arslan, 2024).

Media effects were mostly definite amongst students with otherwise similar demographic and identity profiles, suggesting that information environments can markedly alter how diaspora individuals interpret conflicts even when controlling for other factors. This media-centricity highlights the emergent importance of digital information ecosystems in shaping political perceptions in an age of global connectivity. For diaspora communities in particular, digital media assists simultaneous engagement with homeland, host country, and international perspectives, building complex information environments that contrast significantly from those experienced by non-diasporic populations (Bruneau, 2010).

The interaction between media consumption and other variables further illuminates how information environments operate within broader systems of influence. The finding that media effects were strongest among students with strong Turkish belonging suggests that host country integration may improve serious media literacy rather than diminishing it. Correspondingly, the finding that academic discipline moderated media effects points to the importance of educational contexts in developing the analytical tools necessary for critical media consumption. These interaction patterns support ecological models of media influence that situate information processing within broader socio-cultural contexts rather than treating media effects as widespread or uniform (Nicholls & Culpepper, 2020).

7.4. Gender-Based Differences in War Perceptions

The finding that 70% of female students highlighted humanitarian dimensions of the conflict not only confirms gendered patterns in conflict perception documented by previous scholars but advances theoretical understanding in three significant ways. First, it validates that gendered interpretive frames persist across transnational contexts, proposing that gender socialization generates durable perceptual frameworks that exceed national boundaries. This finding extends feminist international relations theory by exemplifying how gender operates as a 'traveling' category of analysis across diaspora areas (Koschut, 2023). Second, it contests virtuously constructivist accounts of conflict perception by highlighting how embodied subject positions, rather than just conversational constructions, figure political interpretation. Third, it supplies to the 'emotional turn' in international political sociology by indicating how gendered emotional dispositions (particularly empathy) function as interpretive resources during international crises, confirming the theoretical propositions about affective politics presented in our literature review (Massou et al., 2022). It proposes that emotional framing, empathy, and concern for civilian suffering are more salient amongst female participants. This has important implications for understanding how gender identities shape emotional responses and normative evaluations during periods of conflict.

The 70% humanitarian focus among female students provides substantial empirical support for feminist international relations theories that posit distinctive gendered perspectives on conflict and security. Rather than focusing principally on state sovereignty, territorial control, or military strategy, female students confirmed greater attention to human security dimensions comprising civilian casualties, displacement, psychological trauma, and humanitarian assistance needs. This perceptual pattern allies with feminist security studies' stress on broadening security concepts elsewhere traditional state-centric and militaristic frameworks.

Gender differences persevered crossways various demographic and identity subgroups, suggesting that gendered socialization exerts an influence that transcends other social categories. This finding supports theories of gender as a "master status" that forms political cognition in ways that interact with but are not reducible to other social identities. The robustness of gender effects across diaspora subgroups proposes that gendered political socialization may operate finished transnational processes that maintain consistency across cultural contexts.

The gender differences identified in this study have essential implications for diaspora political mobilization during international conflicts. If female and male diaspora members perceive conflicts complete different prime frames, humanitarian versus strategic, this may stimulus the types of mobilization activities they support and the policy interventions they advocate. Understanding these gendered perceptual patterns could help diaspora organizations to develop more comprehensive approaches that discourse both humanitarian and strategic dimen-

sions of conflicts, possibly broadening their appeal and effectiveness.

While these findings are significant, it is methodologically crucial to acknowledge the pronounced gender imbalance within the sample. The sample's composition, with 74.77% male participants, may over-represent male-centric viewpoints and under-represent the diversity of female perspectives on the conflict, even though it reflects broader patterns of student mobility from Azerbaijan to Türkiye. Therefore, while the greater emphasis on humanitarian consequences among female students is statistically robust within this cohort, caution should be exercised when generalizing this specific finding to the broader Azerbaijani diaspora student population. Explicitly addressing this limitation enhances the study's methodological transparency and suggests a need for future research with more gender-balanced samples to validate these observations.

7.5. Contributions of CHAID Analysis to Conflict Perception Research

The CHAID decision tree produced in this study proposals a thorough and systematic map of how various demographic and attitudinal variables interrelate to shape conflict perceptions. The progressive reduction in entropy transversely the tree structure, culminating in an overall classification accuracy of 78%, approves the methodological robustness of CHAID in uncovering latent segmentation patterns within complex social datasets. The CHAID analysis tinted that perceptions about Ukraine's NATO negotiations, Western influence, and Russia's sphere of influence privileges acted as key nodal points around which students' interpretations of the war diverged.

The emergence of academic discipline and generational cohort (age) as significant moderators within the CHAID model underscores the complex interplay between personal background, educational exposure, and geopolitical cognition (Ayten & Gö-ver, 2024). Students from social science faculties, for instance, demonstrated larger serious engagement with Western and NATO narratives compared to students from technical disciplines.

The methodological contribution of this CHAID application prolongs elsewhere the specific findings to demonstrate the value of decision tree methods for understanding complex sociopolitical perceptions. Contrasting traditional regression approaches that focus on average effects across entire samples, CHAID's segmentation capabilities acknowledged distinct perceptual subgroups with unique attribute combinations. This segmentation approach more precisely reflects the heterogeneity of diaspora communities and avoids oversimplified generalizations about diaspora political attitudes (Milanovic & Stamenkovic, 2016).

The hierarchical structure of the CHAID model revealed contingent relationships between variables that would remain obscured in linear modelling approaches. For example, the finding that media effects activated inversely depending on levels of Turkish belonging illustrates how certain factors become more or less prominent under specific conditions. This conditional understanding of variable influences affiliates with configurational approaches to social science that emphasize how factors combine in context-specific ways rather than exercising uniform effects across all conditions.

The application of CHAID analysis to diaspora conflict perceptions also underwrites organisationally by demonstrating how quantitative segmentation techniques can complement qualitative approaches to diaspora studies. While rich ethnographic and interview-based research remains essential for understanding lived experiences and meaning-making processes within diaspora communities, CHAID analysis bids a complementary approach for identifying patterns across larger populations and testing theoretical propositions about the factors influencing diaspora political attitudes (Akbulut et al., 2022).

While most of our findings aligned with theoretical expectations resulting from international political sociology, several unexpected results warrant discussion. The absence of noteworthy age effects contradicts theoretical expectations concerning generational differences in political socialization. This non-finding challenges assumptions about the distinctive political consciousness of post-Soviet generations and advocates that transnational diaspora contexts may lessen generational variations observed in homeland populations. This non-finding invites deeper theoretical speculation. It is plausible that the shared diasporic experience itself acts as a powerful homogenizing force, overriding the generational divides typically shaped by distinct political socialization periods. For the Azerbaijani diaspora in Türkiye, the collective memory of Soviet-era repression and post-Soviet Russian interventionism, particularly in relation to the Nagorno-Karabakh conflict, may constitute a potent and unifying historical narrative that is transmitted and felt across generations. This shared sense of historical grievance and contemporary geopolitical awareness could create a common interpretive framework for viewing Russian aggression, thereby diminishing the perceptual differences that might otherwise exist between older and younger cohorts who did not directly experience the Soviet era. Correspondingly, the minimal influence of residence duration compared to subjective belonging challenges traditional assimilation theories that emphasize temporal exposure as the primary mechanism of host country influence. This

finding supports more recent constructivist approaches that prioritize subjective identification over objective integration metrics, as theorized by Al-darei and Elhag (2022) in our framework.

7.6. Implications for International Political Sociology

Largely, the study's findings support a prolonged theoretical model of diaspora conflict perceptions that participates identity construction, emotional engagement, media ecology, and host-country socialization. This multilayered model tests unsophisticated realist or rationalist frameworks and facts toward a more nuanced understanding of how international crises are interpreted by mobile, transnational populations.

By demonstrating the interdependence of sociological, psychological, and informational variables in shaping diaspora perceptions, this research delivers empirical evidence for the necessity of incorporating non-material dimensions into contemporary theories of international conflict and diaspora politics.

The integrated model emerging from this study makes numerous vital contributions to international political sociology theory. First, it proves that diaspora perceptions of international conflicts are shaped by multiple, interrelating influences rather than single dominant factors. The finding that identity, belonging, media exposure, gender, and academic discipline all influenced conflict perceptions in different combinations supports ecological approaches to political cognition that emphasize complex causal pathways over monocausal explanations.

Second, the findings challenge simplistic dichotomies between homeland and host country influences on diaspora politics. Rather than choosing between these attachments, Azerbaijani students occurred to feature both Turkish and Azerbaijani perspectives into hybrid interpretive frameworks. This syncretic method provisions transnational perspectives that conceptualize diaspora political consciousness as operating directly across multiple frames of reference rather than fully within single national containers.

Third, the study growths understanding of how emotional and sentimental dimensions shape diaspora politics. The major influence of subjective belonging (beyond objective integration measures) and the prominence of gender-based emotional framing underline how feelings of attachment, empathy, and solidarity motivate particular interpretations of distant conflicts. This affective dimension supports the "emotional turn" in international relations that admits emotions as constitutive forces in global politics rather than solely irrational distortions of rational processes (Koschut, 2023).

Fourth, the findings promote to laity theories in international political sociology by explaining how historical memories apprise present interpretations. The connection between Azerbaijani identity and pro-Ukrainian attitudes shows how past experiences with Russian interventionism create interpretive shapes that are applied to contemporary events. This temporal layering supports theories of "haunting" and "historical analogizing" in international relations that highlight how past events continue to structure present political judgments throughout mutual memory processes (Edkins, 2003).

Finally, the study intrusions methodological pluralism in international political sociology by demonstrating how decision tree analysis can actually capture the complex, contingent relationships between social factors and political perceptions. This methodological approach supports with IPS commitments to studying contextual complexity and circumventing deterministic explanations of political phenomena.

8. Conclusion

From the perspective of international political sociology, the Russia-Ukraine conflict surpasses the narrow boundaries of traditional power politics and emerges as a multidimensional tussle entrenched in competing national identities, historical narratives, and evolving global power structures. This study examined the conflict by analysing its historical, identity-based, and strategic dimensions while directing on the perceptions of Azerbaijani students living in Türkiye.

The findings endorse that diaspora individuals' perceptions of international conflicts are not only sculpted by rational assessments of state behaviour but are strictly prejudiced by identity attachments, emotional dynamics, collective memories, and media exposure. Students with a compact sense of belonging to Türkiye were intentionally more prospective to perceive Russia as the aggressor, while those with a strong Azerbaijani identity were more supportive of Ukraine's resistance contempt of Türkiye's aloof stance on both sides. Besides, regular exposure to international media sources cultivated more thoughtful and nuanced perspectives, while female students presented a solider emphasis on the humanitarian consequences of the war.

The CHAID analysis further recognized the hierarchical structure of these influences, prominence the interplay between demographic factors, identity affiliations, and attitudinal variables. This covered model reinforces the idea that thoughtful conflict perceptions requires moving beyond state-centric approaches and incorporating the social and emotional dimensions that diaspora communities embody.

Essentially, the results advocate that the Russia-Ukraine conflict is probable to escalate beyond a regional crisis, underwriting to greater polarization and instability within the international system. This

shift toward a multipolar global order will be shaped not only by shifts in military and economic power but also by the reconfiguration of identities, loyalties, and sociopolitical legitimacies across diaspora networks.

Future research should explore comparative analyses amongst diverse diaspora groups to better understand how variations in collective memory, identity formation, and host country integration influence perceptions of international crises. Such studies could offer profounder insights into the sociological foundations of global conflict interpretations and contribute to more inclusive and effective policy responses.

In light of these findings, several practical recommendations materialize. First, policymakers and diaspora organizations should develop pointed engagement strategies that appreciate the complex identity affiliations within diaspora communities. Initiatives promoting transnational dialogue, cultural diplomacy, and inclusive narratives can help moderate identity-driven division during international crises. Second, the findings highlight the need to support media literacy programs tailored for diaspora populations, predominantly in contexts where access to miscellaneous information sources unsympathetically shapes conflict perceptions. Educational interventions aimed at augmenting critical media consumption skills could empower diaspora individuals to navigate disinformation environments more effectively and foster more nuanced identifications of complex geopolitical events. Third, governments hosting knowing diaspora communities should design supportive integration policies that encourage both a tough sense of belonging to the host society and respect for homeland attachments, thus allowing additional balanced and resilient political orientations during times of global crisis.

Generally, by recognizing the layered influences of identity, emotion, and information in diaspora conflict perceptions, both academic and policy communities can improve more active strategies for likable transnational populations in a progressively complex international landscape.

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Research Article

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Beyond Income Constraints: Green Economy Transitions and Sustainable Development in Emerging Economies[1]

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Abstract

This study examines the patterns, determinants, and implications of green economy performance across 93 developing countries using data from the Global Green Economy Index (GGEI). Despite growing adoption of green economy frameworks, empirical evidence regarding implementation and outcomes in developing country contexts remains limited. Through Generalized Least Squares regression analysis and case studies of high-performing countries, we identify key factors enabling green economy advancement despite resource constraints. Our findings reveal significant heterogeneity in performance across regions and income groups, with European and Latin American developing countries generally outperforming counterparts in other regions. Carbon efficiency (GHG Emissions/GDP) and clean energy deployment emerge as the strongest determinants of overall performance (coefficients of 0.148 and 0.086 respectively, $p<0.05$), while governance quality demonstrates consistently significant associations across all model specifications. Income-stratified analysis shows that environmental protection and climate policy demonstrate stronger relationships with performance in low-income contexts, while market mechanisms become increasingly important at higher income levels. The success of countries like Costa Rica and Ethiopia illustrates that developing economies can pursue growth models that integrate environmental sustainability from early development stages. These findings provide an evidence-based foundation for policy prioritization in resource-constrained settings, challenging conventional assumptions that substantial green economy advancement requires high income levels or abundant resources.

Keywords: Green Economy, Sustainable Development, Developing Countries, Environmental Policy, Climate Change Mitigation.

JEL Codes: Q01, Q56, O44

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1. Introduction

The confluence of climate change, resource depletion, and persistent socioeconomic challenges has catalyzed the emergence of the green economy concept as a potential pathway to sustainable development (Erdoğdu et al., 2025). The United Nations Environment Programme defines green economy as one that results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2011). This paradigm posits that economic growth need not come at the expense of environmental sustainability or social inclusion, but rather, these objectives can be pursued synergistically through strategic policy interventions and investments.

For developing countries, the transition to a green economy presents a complex calculus of opportunities and challenges. While these nations often possess abundant natural resources and latent green growth potential, they simultaneously face resource constraints, governance limitations, and competing development priorities that may impede green transitions. The traditional "grow first, clean up later" development model that characterized many advanced economies' historical trajectories has become increasingly untenable in the context of planetary boundaries and climate imperatives (Grübler, 2020). Consequently, developing countries are now seeking alternative development pathways that can simultaneously address economic growth, social well-being, and environmental sustainability.

Despite the growing prominence of green economy as a development framework, empirical evidence regarding its implementation and outcomes in developing country contexts remains fragmented (Ragulina et al., 2022). While numerous theoretical frameworks and policy prescriptions abound, systematic cross-country analyses examining the determinants of successful green economy transitions in developing nations are relatively scarce. Furthermore, the heterogeneity among developing countries—spanning geographical contexts, resource endowments, governance structures, and socioeconomic conditions—necessitates nuanced, context-specific understandings of green economy performance.

This study addresses these knowledge gaps by conducting a comprehensive analysis of green economy performance across 93 developing countries using data from the Global Green Economy Index (GGEI). By examining patterns, drivers, and outcomes of green economy initiatives in these contexts, this research aims to identify evidence-based strategies and policy frameworks that can accelerate sustainable development in resource-constrained settings. The analysis prioritizes practical insights that can inform policymaking, investment decisions, and development cooperation in support of green transitions.

1.1. Research Questions

This study is guided by the following research questions:

1. How do developing countries perform in terms of green economy indicators, and what patterns emerge across different geographical regions and income groups?
2. Which specific dimensions and indicators of green economy performance demonstrate the strongest relationship with overall sustainable development outcomes in developing country contexts?
3. What common characteristics and policy frameworks distinguish high-performing developing countries in green economy transitions from lower-performing peers?
4. To what extent do resource constraints and development challenges influence green economy performance, and how have successful countries navigated these limitations?
5. What targeted policy interventions, investment strategies, and institutional arrangements can most effectively accelerate green economy transitions in developing countries?

1.2. Significance and Approach

This research employs a mixed-methods approach, combining quantitative analysis of GGEI data across 18 indicators with qualitative case studies of high-performing developing countries. By triangulating findings across multiple analytical dimensions, the study aims to produce robust, contextually-grounded insights that transcend the limitations of single-method approaches. This comprehensive methodology enables the identification of both generalizable patterns and context-specific success factors that can inform differentiated policy approaches.

The findings of this study hold significance for multiple stakeholders, including national policymakers in developing countries, international development agencies, environmental organizations, investors, and academic researchers. By illuminating pathways to successful green economy transitions that accommodate the unique constraints and opportunities of developing countries, this research contributes to ongoing global efforts to reconcile economic development with environmental sustainability and social inclusion. Ultimately, the insights generated can inform more effective strategies for achieving the Sustainable Development Goals (SDGs) in diverse developing country contexts.

The subsequent sections of this paper proceed as follows: Section 2 reviews relevant literature on green economy concepts and their application in developing countries; Section 3 describes the data sour-

ces and analytical methodology; Section 4 presents the empirical findings; Section 5 discusses the implications of these findings for theory and practice; and Section 6 concludes with policy recommendations and directions for future research.

2. Literature Review

2.1. Theoretical Foundations of the Green Economy Concept

The concept of green economy has evolved considerably over the past four decades, emerging from earlier constructs like sustainable development, ecological modernization, and environmental economics. The theoretical foundations can be traced to multiple intellectual traditions that have converged around the possibility of reconciling economic growth with environmental sustainability and social equity (Jackson, 2017; Raworth, 2017; Victor, 2019).

The earliest articulation of green economy principles emerged from Pearce et al.'s (1989) seminal work on the green blueprint for sustainable development, which first systematically articulated the potential compatibility between economic growth and environmental sustainability. This foundational work built upon earlier contributions from environmental economics (Baumol & Oates, 1988; Tietenberg, 1988) and was further developed through subsequent contributions from ecological economics (Costanza et al., 1997; Daly, 1997; Martinez-Alier, 2002). These scholars emphasized the embeddedness of economic systems within planetary boundaries and advocated for development approaches that respect ecological limits while promoting human wellbeing.

The modern articulation of green economy gained international prominence following the 2008 global financial crisis, when UNEP (2011) presented its influential definition of green economy as one that "results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities." This framing represented a significant departure from conventional development models by proposing that environmental sustainability, economic growth, and social inclusion could be pursued simultaneously rather than sequentially (Barbier, 2012; Bowen & Hepburn, 2014; Hickel & Kallis, 2020).

Subsequent theoretical developments have expanded and refined green economy concepts through multiple disciplinary lenses. The Porter Hypothesis (Porter & van der Linde, 1995; Ambec et al., 2013; Cohen & Tubb, 2018) provided early theoretical support for win-win scenarios between environmental regulation and economic competitiveness, arguing that properly designed environmental policies could trigger innovation that often compensates for compliance costs. This perspective has been further developed through endogenous growth theory models that incorporate environmental considerations (Aghion & Howitt, 2009; Acemoglu et al., 2012; Hémous, 2016).

Ecological modernization theory has emerged as another influential theoretical framework, emphasizing technological innovation and institutional reform as primary drivers of green transformations (Mol et al., 2020; Jänicke, 2012; Meadowcroft, 2012). Proponents argue that advanced capitalist societies can resolve environmental problems through continued modernization processes, including technological innovation, economic restructuring, and institutional adaptation (Spaargaren & Mol, 1992; Huber, 2008; Buttel, 2000).

Critical perspectives have emerged challenging mainstream green economy approaches. Political ecology scholars (Peet et al., 2011; Robbins, 2012; Perreault et al., 2015) emphasize power relations, distributional conflicts, and the political nature of environmental transformations. Post-development theorists (Escobar, 2015; Kothari et al., 2019) question whether green economy frameworks adequately address structural inequalities and colonial legacies that shape contemporary environmental challenges. Feminist ecological economics (Mellor, 2006; Nelson, 2008; Bauhardt, 2014) highlights gender dimensions often overlooked in mainstream green economy discourse.

More recently, socio-technical transitions theories (Geels et al., 2017; Köhler et al., 2019; Sovacool, 2016) have examined green economy development through multi-level transitions frameworks, emphasizing the co-evolution of technologies, institutions, and social practices. These approaches highlight the importance of niche innovations, regime dynamics, and landscape pressures in driving sustainability transitions (Markard et al., 2012; Turnheim et al., 2015).

Transformation studies have emerged as a distinct field examining fundamental changes in social-ecological systems (O'Brien & Sygna, 2013; Feola, 2015; Patterson et al., 2017). These approaches emphasize agency, power, and the role of values and worldviews in driving systemic change toward sustainability (Fazey et al., 2018; Moore et al., 2018).

2.2. Empirical Studies on Green Economy in Developing Countries

While theoretical frameworks for green economy have proliferated, empirical research examining implementation and outcomes in developing country contexts has expanded significantly in recent years, though important gaps remain. Early empirical studies predominantly focused on advanced economies (York & Rosa, 2003; Stern, 2004), with limited

attention to the unique challenges and opportunities facing developing nations (Bina, 2013; Faccer et al., 2014; Brand, 2012). This imbalance has begun to shift substantially, with a growing body of literature addressing green economy transitions across diverse developing and emerging economies.

Comprehensive case study research has documented emerging green economy initiatives across multiple developing regions. In Africa, studies have examined green industrialization efforts in Ethiopia (Oqubay, 2018; Mulu, 2021), Kenya's renewable energy expansion (Newell & Phillips, 2016; Ochieng et al., 2018), and South Africa's green economy policies (Nhamo, 2013; Rennkamp & Westin, 2013; Death, 2014). Research in Rwanda has highlighted successful forest restoration and environmental governance reforms (Huggins, 2017; Leegwater, 2015), while studies in Ghana have examined green mining initiatives and environmental policy implementation (Hilson & Maconachie, 2020; Crawford et al., 2016).

Latin American research has provided extensive documentation of green economy approaches across the region. Studies of Brazil's environmental policies have examined both achievements and contradictions in green industrial development (Viola & Franchini, 2018; Hochstetler, 2020; May et al., 2016). Costa Rica's payment for ecosystem services programs have received considerable scholarly attention (Pagiola et al., 2005; Wunder & Albán, 2008; Börner et al., 2017). Research in Colombia has examined post-conflict environmental governance and green peace initiatives (Baptiste et al., 2017; Morales et al., 2018). Mexico's green growth strategies have been analyzed through multiple disciplinary perspectives (Torres & Carlón, 2018; Altamirano-Cabrera & Fonseca, 2020).

Asian developing countries have been the subject of extensive green economy research, reflecting the region's economic dynamism and environmental challenges. China's green development policies have attracted substantial scholarly attention (Wang & Li, 2016; Stern & Jotzo, 2010; Liu & Diamond, 2005), with particular focus on renewable energy deployment (Lema & Ruby, 2007; Lewis, 2013), air pollution control (Zheng et al., 2014; Ghanem & Zhang, 2014), and green finance mechanisms (Zhang et al., 2019; Zhou et al., 2020). India's green economy initiatives have been examined across multiple sectors (Dubash et al., 2013; Aklin & Urpelainen, 2018; Chaudhary et al., 2018), including renewable energy transitions (Kapoor et al., 2014; Schmidt & Huenteler, 2016) and sustainable agriculture (Krishna et al., 2017; Miglani et al., 2018).

Studies in Southeast Asia have documented green economy initiatives across ASEAN countries (Teng & Koh, 2020; Elliott, 2012). Indonesia's forest governance and REDD+ implementation have received considerable attention (Murdiyarso et al., 2012; Pacheco et al., 2012; Indrarto et al., 2012). Thailand's green growth policies have been analyzed in relation to industrial development and environmental management (Dhakal et al., 2018; Pongsiri, 2018). Vietnam's environmental policy transitions have been examined through multiple analytical frameworks (Nguyen & Vo, 2015; Dang & Weiss, 2021).

Sector-specific analyses have provided detailed insights into particular dimensions of green economy development across developing regions. Renewable energy transitions have been extensively studied, with research documenting enabling factors, barriers, and outcomes across diverse contexts (IRENA, 2019; REN21, 2021). Studies have examined solar energy deployment in India (Grover, 2016; Chatterjee, 2018), wind power development in China (Luo et al., 2012; Yuan et al., 2015), and hydropower projects across multiple African countries (Zarfl et al., 2015; Siciliano et al., 2015).

Green agriculture and food systems research has documented sustainable farming practices and their impacts across developing regions (Pretty et al., 2018; Reganold & Wachter, 2016). Studies have examined agroecological transitions in Latin America (Altieri & Toledo, 2011; Giraldo & Rosset, 2018), sustainable intensification in Africa (Tittonell & Giller, 2013; Vanlauwe et al., 2014), and climate-smart agriculture implementation across multiple countries (Lipper et al., 2014; Steenwerth et al., 2014).

Research on payment for ecosystem services programs has assessed environmental and social impacts across diverse developing contexts (Börner et al., 2017; Salzman et al., 2018). Studies have examined forest conservation programs in Costa Rica (Daniels et al., 2010; Robalino et al., 2015), watershed management initiatives in China (Liu et al., 2008; Yin et al., 2014), and biodiversity conservation projects across multiple African countries (Börner & Vosti, 2013; Samii et al., 2014).

Green finance and investment research has examined the challenges of mobilizing capital for sustainability transitions in resource-constrained settings (Volz et al., 2020; Monasterolo et al., 2017; Geddes et al., 2018). Studies have analyzed green bonds markets in emerging economies (Flammer, 2021; Fatica et al., 2021), sustainable banking initiatives (Scholtens, 2017; Weber, 2018), and climate finance mechanisms (Buchner et al., 2019; Falconer & Stadelmann, 2014).

Comparative cross-country analyses have emerged with increasing methodological sophistication. Sonnenschein and Mundaca (2016) analyzed determinants of renewable energy deployment across 122 countries, finding significant impacts of policy instruments and institutional quality. Burke et al. (2015) examined relationships between economic growth and carbon emissions across multiple developing economies, identifying heterogeneous environmen-

tal Kuznets curve patterns. Jakob et al. (2020) analyzed green growth patterns across emerging economies, documenting varied decoupling trajectories.

Recent meta-analyses and systematic reviews have begun to synthesize findings across multiple studies and contexts. Lamb et al. (2021) conducted a comprehensive review of decoupling studies, finding limited evidence for absolute decoupling at necessary scales. Haberl et al. (2020) systematically examined material footprint trends across developing countries, identifying persistent coupling between material use and economic growth. These synthetic studies provide important perspective on the aggregate evidence regarding green economy transitions in developing contexts.

2.3. Green Economy and Sustainable Development Outcomes

The relationship between green economy initiatives and broader sustainable development outcomes has received extensive scholarly attention across multiple disciplines and analytical frameworks. Research examining this relationship has produced nuanced findings that highlight both opportunities and challenges in achieving integrated social, economic, and environmental objectives through green economy approaches.

Economic outcomes from green economy initiatives have been extensively studied, revealing generally positive but highly heterogeneous effects across contexts and timeframes. Barbier and Burgess (2020) assessed economic impacts of green stimulus packages across 20 developing countries during the COVID-19 recovery period, finding net positive employment effects but with significant variation across sectors, skill categories, and regional contexts. Their analysis demonstrated that green investments generated higher employment multipliers than conventional stimulus measures but required complementary policies to ensure inclusive benefits.

Employment impacts of green economy transitions have received particular attention given concerns about just transitions and distributional effects. Fankhauser et al. (2008) analyzed employment effects of renewable energy transitions across 15 middle-income countries, finding net positive impacts but with significant distributional implications across regions, skill categories, and industrial sectors. More recent studies have examined green job creation in specific contexts, including Apergis and Salim (2015) on renewable energy employment in developing countries, and Cameron and van der Zwaan (2018) on employment effects of solar energy deployment across multiple emerging economies.

Green industrial development outcomes have been examined through multiple analytical frameworks. Huang et al. (2019) assessed eco-industrial development initiatives across Asian economies, documenting productivity improvements alongside notable adjustment costs for specific industries and worker groups. Altenburg and Assmann (2017) examined green industrial policy outcomes across multiple developing countries, finding that successful initiatives typically combined environmental objectives with broader industrial development strategies rather than treating them as separate policy domains.

Research on environmental outcomes has documented both significant achievements and persistent limitations of green economy approaches. Environmental effectiveness studies have examined whether green economy initiatives deliver measurable environmental improvements. Nhemachena et al. (2018) evaluated environmental impacts of green agriculture initiatives across 12 African countries, finding significant improvements in resource efficiency indicators but limited effects on absolute environmental pressures such as total water consumption and nutrient runoff.

Air quality improvements from green economy initiatives have been documented across multiple contexts. Zheng et al. (2014) examined air quality impacts of China's green development policies, finding significant improvements in urban areas with strong policy implementation but persistent challenges in industrial regions. Ghanem and Zhang (2014) analyzed impacts of environmental regulations on air quality across Chinese cities, documenting substantial health co-benefits from emissions reductions.

Forest conservation outcomes from green economy programs have shown mixed results across different institutional and economic contexts. Clement (2010) examined forest conservation outcomes from green economy programs in Southeast Asia, identifying positive effects moderated by governance quality, tenure security, and community participation mechanisms. Börner et al. (2017) conducted a global meta-analysis of payment for ecosystem services programs, finding positive but modest conservation effects that varied significantly with program design and local institutional contexts.

Climate policy outcomes have been assessed through multiple analytical frameworks examining both mitigation and adaptation dimensions. McAfee (2016) analyzed climate policy outcomes in Latin American countries pursuing green economy strategies, finding emissions reductions in specific sectors often offset by continued expansion of carbon-intensive activities elsewhere in these economies. This research highlighted the importance of economy-wide policy coherence rather than sectoral approaches to climate policy.

Adaptation outcomes from green economy initiatives have received increasing attention as climate impacts intensify. Pauw (2015) examined climate adaptation co-benefits from green economy investments

across multiple African countries, finding significant potential but requiring explicit integration of adaptation considerations into policy design. Reid et al. (2018) assessed ecosystem-based adaptation initiatives across developing countries, documenting positive outcomes for both environmental resilience and community livelihoods when implemented with appropriate stakeholder engagement.

Social dimensions of green economy transitions have been extensively examined, with research highlighting both opportunities and risks for social equity and inclusion. Distributional analysis has become increasingly sophisticated, moving beyond aggregate impact assessments to examine effects across different socioeconomic groups, geographic regions, and demographic categories.

Poverty and livelihood impacts have been studied across multiple contexts and intervention types. Newell et al. (2021) evaluated livelihood impacts of green economy initiatives across six African countries, finding uneven access to benefits across socioeconomic groups, with higher-income households often capturing disproportionate benefits from green economy opportunities. This research emphasized the importance of explicitly pro-poor policy design rather than assuming that green economy benefits would automatically reach disadvantaged populations.

Gender dimensions of green economy transitions have received growing scholarly attention. Bauhardt (2014) examined gender implications of green economy policies across multiple European and developing country contexts, finding that women often face differential impacts due to their distinct roles in natural resource management, informal economic activities, and household energy provision. Arora-Jonsson (2011) analyzed women's participation in forest governance and conservation initiatives, documenting both opportunities and barriers to meaningful engagement in green economy programs.

Indigenous peoples and traditional communities have been the subject of specific research examining their roles in and impacts from green economy initiatives. Börner and Vosti (2013) analyzed impacts of conservation programs on indigenous communities across Latin America, finding complex outcomes that varied significantly with community autonomy, resource rights, and program design features. Rights-based approaches to green economy implementation have been advocated by scholars emphasizing the importance of free, prior, and informed consent processes (Mahanty & McDermott, 2013; Schroeder, 2010).

Participatory dimensions of green economy planning and implementation have been examined across multiple contexts. Tanner and Allouche (2011) analyzed participatory aspects of green economy planning in South Asian contexts, documenting significant variation in inclusiveness, representation, and meaningful participation across different policy processes. This research highlighted tensions between technical efficiency and democratic participation in green economy governance.

Land tenure and resource access implications have become increasingly prominent in green economy research. Borras et al. (2013) examined land tenure implications of biofuel initiatives in Southeast Asian countries, highlighting displacement risks for marginalized communities and the importance of secure tenure arrangements for equitable green economy outcomes. Fairhead et al. (2012) analyzed impacts of REDD+ initiatives on local communities across multiple African countries, documenting both opportunities and risks associated with forest carbon programs.

Urban-rural dynamics in green economy transitions have received growing attention as most developing countries experience rapid urbanization alongside continued rural poverty. Cohen (2006) examined urban environmental management initiatives across multiple developing country cities, finding that successful programs typically integrated social and environmental objectives through participatory planning processes. Rural green economy opportunities have been analyzed through sustainable agriculture, ecosystem services, and renewable energy frameworks (Pretty et al., 2018; Power, 2010).

2.4. Methodological Approaches and Analytical Frameworks

The methodological approaches employed in green economy research have evolved considerably over the past two decades, reflecting both increasing analytical sophistication and persistent challenges in measuring complex, multidimensional phenomena. Early studies relied primarily on qualitative case studies and descriptive statistics (York & Rosa, 2003; Stern, 2004), with limited attention to causal identification, systematic cross-country comparison, or rigorous measurement of multidimensional outcomes.

Contemporary methodological approaches demonstrate significant innovations that have enhanced analytical rigor and policy relevance. The development of comprehensive indicator frameworks has facilitated more systematic measurement and comparison of green economy performance across diverse contexts. Notable frameworks include the Green Growth Index (Berger-Schmitt, 2021), the Environmental Performance Index (Wendling et al., 2020), the Green Economy Index (Dual Citizen, 2018), and various UN Sustainable Development Goals measurement systems (Sachs et al., 2021). These frameworks enable cross-country comparison while accommodating contextual differences in development priorities and resource endowments.

Advanced econometric techniques have strengt-

hened causal inference in green economy policy evaluation. Instrumental variables approaches have been employed to address endogeneity concerns in examining relationships between environmental policies and economic outcomes (Greenstone & Hanna, 2014; Ryan, 2012). Regression discontinuity designs have been utilized to evaluate specific policy interventions, including environmental regulations (Tanaka, 2015) and renewable energy subsidies (Barrows & Ollivier, 2018). Difference-in-differences methods have been applied to assess impacts of green economy programs across multiple contexts (Jayachandran et al., 2017; Rosenthal et al., 2022).

Quasi-experimental research designs have become increasingly prevalent in green economy evaluation studies. Natural experiments arising from policy variations, geographic boundaries, or temporal discontinuities have been leveraged to identify causal effects of environmental interventions (Bruederle & Hodler, 2018; Dell et al., 2014). Randomized controlled trials have been implemented to evaluate specific green economy interventions, particularly in areas such as payments for ecosystem services (Jayachandran et al., 2017; Börner et al., 2017) and sustainable agriculture adoption (Emerick et al., 2016; Beaman et al., 2013).

Mixed-methods research designs combining statistical analysis with qualitative case studies have enabled more nuanced understanding of causal mechanisms and contextual factors mediating green economy outcomes (Lockwood, 2015; Newell & Phillips, 2016; Tashakkori & Teddlie, 2010). These approaches facilitate investigation of complex social-ecological systems where purely quantitative or qualitative methods may be insufficient to capture relevant dynamics.

Spatial analysis techniques have been increasingly applied to examine geographic dimensions of green economy transitions. Geographic information systems (GIS) analysis has been employed to assess land use changes associated with green economy initiatives (Lambin & Meyfroidt, 2011; Rudel et al., 2009). Spatial econometric methods have been utilized to examine spillover effects and spatial dependencies in environmental policy outcomes (Manski, 2013; LeSage & Pace, 2009).

Big data approaches have emerged as important tools for green economy research, leveraging satellite imagery, administrative datasets, and other large-scale data sources. Remote sensing data has been employed to monitor forest cover changes, urban expansion, and agricultural land use patterns (Hansen et al., 2013; Gorelick et al., 2017). Machine learning techniques have been applied to analyze complex environmental datasets and identify patterns in green economy performance (Reichstein et al., 2019; Rolnick et al., 2019).

Integrated assessment modeling has been employed to examine complex interactions between economic, social, and environmental systems in green economy transitions. Computable general equilibrium models have been adapted to incorporate environmental dimensions and assess economy-wide impacts of green policies (Böhringer & Löschel, 2006; Babiker et al., 2001). Agent-based modeling approaches have been utilized to examine micro-level behaviors and their aggregate implications for green economy outcomes (Filatova et al., 2013; Parker et al., 2003).

Life cycle assessment methodologies have been extensively applied to evaluate environmental impacts of green economy initiatives across their entire production and consumption cycles (Hellweg & Milà i Canals, 2014; Laurent et al., 2012). These approaches enable comprehensive assessment of environmental trade-offs and identification of optimization opportunities across different stages of green economy value chains.

Participatory research methods have been increasingly employed to incorporate stakeholder perspectives and local knowledge into green economy research (Reed, 2008; Fazey et al., 2014). Community-based participatory research approaches have been utilized to examine local-level impacts and implementation processes of green economy initiatives (Israel et al., 2012; Wallerstein et al., 2017).

Despite these methodological advances, significant challenges persist in green economy research. Measurement difficulties remain substantial, particularly regarding the multidimensional nature of green economy concepts and complex interactions between environmental, economic, and social outcomes (Ringius, 2002; Pirgmaier, 2020). Standard economic indicators often fail to capture environmental and social dimensions adequately, while environmental indicators may not reflect economic and social implications of green economy initiatives.

Data limitations continue to constrain analysis in many developing country contexts, with inconsistent reporting standards, limited time series availability, and measurement gaps for key indicators (Jerven, 2013; Stiglitz et al., 2009). These limitations are particularly acute for sub-national analysis and examination of distributional impacts across different population groups.

Causal attribution remains challenging given the complex, systemic nature of green economy transitions and multiple interacting factors influencing outcomes (Levin et al., 2012; Olsson et al., 2014). Green economy initiatives typically operate within broader policy environments, making it difficult to isolate specific intervention effects from confounding factors.

Temporal challenges include the mismatch between short-term research timeframes and long-term nature of many green economy impacts, particularly regarding environmental and social outcomes that may require decades to materialize fully (Carpenter et al., 2009; Folke et al., 2010). This temporal mismatch complicates evaluation of green economy effectiveness and may lead to premature conclusions regarding intervention impacts.

Scale challenges involve difficulties in linking local-level interventions with regional, national, and global outcomes, particularly regarding global environmental challenges such as climate change and biodiversity loss (Cash et al., 2006; Gibson et al., 2000). Multi-scale analysis requires sophisticated methodological approaches that remain under-developed in many research contexts.

2.5. Research Gaps and Contribution of the Present Study

Despite the substantial growth in green economy research over the past decade, several significant gaps remain that limit evidence-based policymaking and effective implementation in developing country contexts. This study addresses these gaps through systematic cross-country analysis of green economy performance across diverse developing economies, contributing both methodological innovations and substantive empirical insights.

The first major gap concerns the limited scope of systematic cross-country comparative analysis examining comprehensive green economy performance across developing countries. While numerous case studies document specific green economy initiatives in individual countries (Oqubay, 2018; Hochstetler, 2020; Newell & Phillips, 2016), and some studies examine particular dimensions such as renewable energy deployment (Sonnenschein & Mundaca, 2016) or carbon intensity trends (Burke et al., 2015), systematic analyses examining multidimensional green economy performance across large samples of developing countries remain scarce. Existing comparative studies typically focus on specific sectors, regions, or policy instruments rather than comprehensive assessment of overall green economy advancement.

This analytical gap reflects both data limitations and methodological challenges in conducting rigorous cross-country analysis of multidimensional phenomena. The present study contributes by analyzing patterns across 93 developing countries using the comprehensive GGEI framework, which encompasses 18 indicators across four dimensions of green economy performance. This systematic approach enables identification of broader trends, relationships, and patterns that transcend individual country experiences while maintaining sensitivity to contextual variations across diverse developing economies.

The second significant gap involves inadequate theoretical and empirical understanding of the determinants of successful green economy transitions in developing country contexts. While conceptual frameworks propose various enabling factors including governance quality, natural resource endowments, technological capacity, and international support (UNEP, 2011; Barbier, 2012), systematic empirical analysis of their relative importance and interactions across diverse contexts remains underdeveloped. Existing studies often examine single factors or limited sets of variables, making it difficult to assess relative importance and potential synergies between different enabling conditions.

This study addresses this gap through comprehensive econometric analysis examining relationships between green economy performance and multiple potential determinants, including governance quality, development level, regional characteristics, and specific policy dimensions. The analysis employs advanced econometric techniques including instrumental variables estimation to strengthen causal inference regarding key determinants of green economy success. Income-stratified and regional analyses enable identification of context-specific patterns and relationships that inform differentiated policy approaches.

The third major gap concerns limited empirical guidance on how developing countries can effectively navigate resource constraints and competing development priorities while advancing green economy objectives. Existing research provides limited systematic evidence regarding effective sequencing strategies, policy prioritization frameworks, and institutional arrangements that enable green economy advancement under resource limitations. While individual case studies document specific country experiences (Spratt et al., 2014; Nhamo, 2013), synthesis across multiple contexts and systematic identification of generalizable principles remains limited.

This study contributes by examining how successful developing countries have overcome resource limitations through strategic approaches and targeted investments in high-leverage dimensions. The analysis identifies specific indicators and dimensions with the strongest relationships to overall green economy performance, providing empirical foundation for policy prioritization in resource-constrained settings. Case study analysis of high-performing countries despite resource limitations illustrates concrete approaches that other developing countries might adapt to their specific contexts.

The fourth gap involves methodological challenges in establishing causal relationships between policies, institutional arrangements, and green economy outcomes in developing country contexts. Much existing research struggles with endogeneity concerns, particularly regarding the relationship between eco-

nomic development and environmental outcomes, limiting confidence in policy recommendations. Cross-sectional studies cannot adequately address temporal dynamics, while longitudinal studies often face data limitations that constrain analytical rigor.

This study addresses methodological gaps through several innovations. First, it employs Generalized Least Squares estimation to address heteroscedasticity common in cross-country datasets. Second, it implements instrumental variables approaches to address potential endogeneity between development levels and green economy performance. Third, it conducts extensive robustness checking using alternative estimators, variable specifications, and sample compositions to validate core findings. Fourth, it employs mixed-methods analysis combining statistical findings with qualitative case study insights to strengthen causal inference and contextual understanding.

The fifth gap concerns limited empirical evidence regarding the transferability and scalability of green economy approaches across diverse developing country contexts. While case studies often document successful initiatives in specific contexts, systematic analysis of which factors enable successful transfer and adaptation of green economy approaches across different institutional, economic, and environmental contexts remains underdeveloped. This limitation constrains the ability of policymakers and development agencies to learn from successful experiences in other countries.

This study addresses transferability gaps through systematic regional and income-stratified analyses that identify both generalizable factors and context-specific determinants of green economy performance. By examining patterns across 93 countries spanning multiple regions, income levels, and institutional contexts, the analysis enables identification of factors that appear important across diverse contexts versus those that may be more context-specific. This comparative approach provides more robust foundation for policy learning and adaptation across different developing country contexts.

The sixth gap involves insufficient attention to the heterogeneity among developing countries in existing green economy research. Much research either treats developing countries as a homogeneous group or focuses on specific regions or income categories without systematic comparison across different contexts. This analytical limitation overlooks important variations in resource endowments, institutional capacities, development priorities, and environmental challenges that may require differentiated green economy approaches.

This study contributes by explicitly examining heterogeneity across regions, income groups, and development contexts. Regional analysis identifies distinct patterns in green economy determinants across Africa, Asia, Latin America, Europe, and the Pacific. Income-stratified analysis examines how green economy pathways evolve across different development stages. This systematic attention to heterogeneity enables more nuanced understanding of green economy transitions and more targeted policy recommendations for different developing country contexts.

By addressing these research gaps through systematic empirical analysis, methodological innovations, and comprehensive cross-country comparison, this study aims to provide a more robust foundation for green economy theory and practice in developing countries. The findings contribute to both academic understanding of green economy transitions and practical guidance for policymakers, development agencies, and other stakeholders seeking to advance sustainable development objectives in diverse developing country contexts.

3. Methodology

3.1. Data Sources and Sample Selection

This study employs data from the Global Green Economy Index (GGEI), a comprehensive dataset measuring green economy performance across 160 countries worldwide. The GGEI encompasses 18 indicators organized into four dimensions: Climate Change & Social Equity, Sector Decarbonization, Markets & ESG Investment, and Environment. Each indicator provides three metrics: a progress result (measuring improvement over time), a distance result (measuring absolute performance against benchmarks), and an overall result (a combined metric).

For this analysis, we filtered the dataset to include only developing countries as defined by the World Bank's income classification system. Using the fiscal year 2025 classifications, our sample comprises 93 countries across low-income (GNI per capita ≤ $1,145), lower-middle-income (GNI per capita $1,146-$4,515), and upper-middle-income (GNI per capita $4,516-$14,005) categories. This sampling approach ensures our analysis focuses specifically on the developing world context while maintaining sufficient cross-country variation to identify meaningful patterns and relationships.

3.2. Variables and Measurement

3.2.1. Dependent variable

The primary dependent variable in our analysis is the overall GGEI score, which represents a country's composite green economy performance. This variable ranges from 0 to 1, with higher values indicating stronger performance. For sensitivity analyses, we also employ alternative dependent variables including the progress result and distance result separately to disentangle temporal improvement from

absolute performance.

3.2.2. Independent variables

Our models incorporate several categories of independent variables:

- Green Economy Dimension Scores: We employ the four dimension scores (Climate Change & Social Equity, Sector Decarbonization, Markets & ESG Investment, and Environment) to examine their relative contributions to overall performance.
- Specific Indicator Metrics: All 18 individual indicators are analyzed to identify the most significant drivers of green economy performance. These include indicators such as GHG emissions per GDP, electricity & heat decarbonization, gender equality measures, and environmental protection metrics.
- Country-Level Controls: We incorporate several country-level control variables to account for factors that might influence green economy performance:
    1. GDP per capita (log-transformed)
    2. Population (log-transformed)
    3. Land area (log-transformed)
    4. Governance indicators from the World Bank's Worldwide Governance Indicators
    5. Regional dummy variables for Africa, Asia, Europe, Latin America & Caribbean, and Pacific
- Additional Developmental Factors: To better understand the interplay between green economy and broader development outcomes, we include:
    1. Human Development Index scores
    2. Urbanization rates
    3. Trade openness (trade as percentage of GDP)
    4. Foreign direct investment inflows

3.3. Analytical Framework and Econometric Approach

3.3.1. Generalized least squares (GLS) estimation

The core of our analytical approach employs Generalized Least Squares (GLS) regression models to examine the determinants of green economy performance. The GLS approach was selected as the primary estimation strategy due to the presence of heteroscedasticity in our cross-country dataset. Preliminary diagnostic tests using the Breusch-Pagan test confirmed the violation of homoscedasticity assumptions required for ordinary least squares (OLS) estimation (Onifade & Olanrewaju, 2020). The GLS method addresses this issue by incorporating the variance structure of the error terms into the estimation procedure, resulting in more efficient and unbiased parameter estimates.

Our base model specification takes the following form:

$$Y_i = \propto + \beta X_i + \tau Z_i + \varepsilon_i$$

Where:

- Y_i represents the green economy performance measure for country i
- X_i is a vector of green economy dimension or indicator variables
- Z_i is a vector of country-level control variables
- ε_i is the error term with non-constant variance

The GLS estimation implements an iterative feasible GLS procedure that estimates the variance structure in the first stage and then incorporates these estimates into a weighted least squares estimation in the second stage. This approach provides robust standard errors that account for the heteroscedastic nature of our cross-sectional data.

3.3.2. Model specifications and robustness checks

We implement several model specifications to ensure the robustness of our findings:

- Hierarchical Models: We begin with parsimonious models including only regional fixed effects, then progressively add control variables and green economy dimensions to assess the stability of coefficients.
- Dimension-Specific Models: We examine each of the four GGEI dimensions separately to identify their individual contributions before combining them in comprehensive models.
- Indicator-Level Analysis: We decompose dimensions into their constituent indicators to identify the specific factors with the strongest relationship to overall performance.
- Income Group Stratification: We conduct separate analyses for low-income, lower-middle-income, and upper-middle-income countries to identify potential heterogeneity in green economy determinants across development stages.
- Alternative Estimators: As robustness checks, we employ alternative estimation approaches including robust regression and quantile regression to address potential outlier influences and examine effects across different segments of the performance distribution.

3.3.3. Endogeneity considerations

To address potential endogeneity concerns, particularly regarding the relationship between economic development and green economy performance, we implement several strategies:

- Instrumental Variables: Where appropriate, we utilize instrumental variables approaches with geographic and historical instruments that influence development pathways but are plausibly exogenous to current green economy policies.
- Fixed Effects: Regional fixed effects help control for unobserved time-invariant factors that might influence both development levels and green economy performance.
- Lag Structures: When examining time-variant relationships, we employ appropriate lag structures to mitigate reverse causality concerns.

3.4. Case Study Selection and Analysis

To complement our quantitative analysis, we employ a strategic case study approach focusing on high-performing developing countries. Using a maximum variation sampling strategy, we select three countries (Costa Rica, Ethiopia, and Albania) representing different income groups, geographical regions, and green economy profiles. These cases facilitate in-depth examination of policy frameworks, institutional arrangements, and strategic approaches that have enabled green economy success despite resource constraints.

For each case study, we conduct a systematic analysis of the countries' performance across all 18 GGEI indicators, identifying areas of excellence and challenges. We supplement this quantitative profile with qualitative information on policy frameworks, institutional arrangements, and historical context, drawing from government documents, international organization reports, and academic literature. This mixed-methods approach enables triangulation between statistical findings and context-specific success factors.

3.5. Limitations and Analytical Constraints

We acknowledge several methodological limitations that contextualize our findings:

- Cross-Sectional Nature: The primary analysis is cross-sectional, limiting causal inferences. While we employ various strategies to address endogeneity, the results should be interpreted as associations rather than strictly causal relationships.
- Data Availability: Not all developing countries have complete data for all indicators, potentially introducing selection bias toward better-documented economies.
- Measurement Challenges: Green economy performance is inherently multidimensional, and while the GGEI provides a comprehensive framework, it may not capture all relevant aspects of sustainability transitions.
- Temporal Limitations: While the progress metrics incorporate temporal change, longer time series would enable more robust analysis of green economy transitions over time.

Despite these limitations, our methodological approach provides a robust framework for identifying patterns, relationships, and success factors in green economy performance across developing countries, yielding valuable insights for both theory and practice.

4. Empirical Results

This section presents the empirical findings from our econometric analysis examining the determinants of green economy performance across 93 developing countries. We begin by presenting the baseline cross-sectional regression results using Generalized Least Squares (GLS) estimation, followed by an extensive set of robustness checks to validate our core findings.

4.1. Cross-Sectional Regression Results

4.1.1. Descriptive statistics

Table 1 presents descriptive statistics for the key variables in our analysis. The average overall GGEI score for developing countries in our sample is 0.47 (on a scale of 0 to 1), with substantial variation ranging from 0.32 (Turkmenistan) to 0.64 (Costa Rica). Notable variation exists across the four dimensions of the GGEI, with the Climate Change & Social Equity dimension showing the highest average score (0.47) and the Environment dimension showing the lowest (0.44).

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Overall GGEI score	0.470	0.062	0.318	0.644
Climate Change & Social Equity	0.474	0.084	0.280	0.667
Sector Decarbonization	0.453	0.091	0.258	0.712

Markets & ESG Investment	0.477	0.079	0.303	0.695
Environment	0.441	0.068	0.298	0.618
Log GDP per capita	7.984	1.121	5.842	9.753
HDI	0.681	0.115	0.394	0.854
Urbanization rate	56.32	18.74	13.25	95.17
Trade openness	76.45	35.21	22.34	178.65
Governance index	-0.352	0.621	-1.873	1.124

Note: N = 93 developing countries based on World Bank income classifications.

4.1.2. Baseline GLS regression results

Table 2 presents the results from our baseline GLS regression models examining the determinants of overall green economy performance. Model 1 includes only regional fixed effects, Model 2 adds country-level control variables, Model 3 incorporates the four GGEI dimensions, and Model 4 presents the full specification with both dimension scores and indicators.

Table 2. GLS Regression Results for Overall GGEI Performance

Variables	Model 1	Model 2	Model 3	Model 4
Regional Fixed Effects				
Africa (reference)	-	-	-	-
Asia	-0.011	-0.008	-0.006	-0.005
	(0.015)	(0.012)	(0.009)	(0.008)
Europe	0.043**	0.031*	0.024*	0.019*
	(0.021)	(0.017)	(0.013)	(0.011)
Latin America & Caribbean	0.032**	0.028*	0.019*	0.016*
	(0.016)	(0.014)	(0.011)	(0.009)
Pacific	0.025*	0.022*	0.018*	0.014
	(0.015)	(0.013)	(0.010)	(0.009)
Country Controls				
Log GDP per capita		0.021**	0.014*	0.008
		(0.009)	(0.008)	(0.007)
HDI		0.137**	0.068*	0.053*
		(0.057)	(0.035)	(0.029)
Urbanization rate		0.001	0.001	0.000
		(0.001)	(0.001)	(0.000)
Trade openness		0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)
Governance index		0.031***	0.021**	0.018**
		(0.011)	(0.009)	(0.008)
GGEI Dimensions				
Climate Change & Social Equity			0.247***	0.231***
			(0.064)	(0.061)
Sector Decarbonization			0.184***	0.162***
			(0.059)	(0.055)
Markets & ESG Investment			0.142**	0.128**

			(0.057)	(0.051)
Environment			0.126**	0.117**
			(0.053)	(0.049)
Key Indicators				
GHG Emissions/GDP				0.148***
				(0.045)
Electricity & Heat				0.086**
				(0.038)
Air Quality				0.073**
				(0.037)
Gender Equality (Workplace)				0.068**
				(0.034)
Transport Decarbonization				0.061*
				(0.033)
Constant	0.442***	0.195***	0.096**	0.084**
	(0.012)	(0.068)	(0.042)	(0.038)
Observations	93	93	93	93
R-squared	0.137	0.289	0.673	0.712

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The baseline regression results in Table 2 reveal several key findings. First, regional variations persist even after controlling for country characteristics, with European and Latin American developing countries demonstrating significantly higher green economy performance relative to African countries (the reference category). Second, the Human Development Index (HDI) and governance quality emerge as significant predictors of green economy performance, suggesting that broader development outcomes and institutional quality are important enablers of green transitions.

Among the GGEI dimensions, Climate Change & Social Equity demonstrates the strongest relationship with overall performance (coefficient = 0.247, p<0.01), followed by Sector Decarbonization (coefficient = 0.184, p<0.01). This suggests that carbon efficiency and decarbonization efforts represent particularly influential aspects of green economy transitions in developing country contexts.

Model 4 identifies the specific indicators with the strongest associations with green economy performance. GHG Emissions/GDP emerges as the most significant indicator (coefficient = 0.148, p<0.01), suggesting that carbon efficiency in economic activities is a critical determinant of overall green economy success. Electricity & Heat decarbonization (coefficient = 0.086, p<0.05) and Air Quality management (coefficient = 0.073, p<0.05) also demonstrate significant positive associations with overall performance.

4.2. Model Diagnostic Tests and Specification Validation

To ensure the appropriateness of our econometric approach and validate the reliability of our findings, we conducted a comprehensive series of diagnostic tests examining the underlying assumptions of our regression models. These tests provide empirical justification for our methodological choices and enhance confidence in the reported results. The primary justification for employing Generalized Least Squares estimation rather than Ordinary Least Squares centers on addressing heteroscedasticity in our cross-country dataset. The Breusch-Pagan test for heteroscedasticity yielded a chi-square statistic of 23.47 with 12 degrees of freedom, generating a p-value of 0.024. This result clearly rejects the null hypothesis of homoscedastic error terms at conventional significance levels, confirming the presence of heteroscedasticity and validating our choice of GLS estimation to obtain efficient parameter estimates.

To assess the appropriateness of our functional form specification, we implemented the Ramsey Regression Equation Specification Error Test (RESET). The test examines whether omitted variables or nonlinear relationships might bias our linear specification. The RESET test generated an F-statistic of 1.83 with 3 and 79 degrees of freedom, yielding a p-value of 0.148. This result fails to reject the null hypothesis of correct specification, supporting the adequacy of our linear functional form for capturing the relations-

hips between green economy performance and our explanatory variables. Multicollinearity assessment revealed acceptable levels of correlation among explanatory variables. Variance Inflation Factors for our key variables remained well below concerning thresholds, with the highest VIF of 3.21 observed for the HDI variable. The GGEI dimension variables demonstrated VIF values ranging from 1.47 to 2.83, indicating that multicollinearity does not substantially compromise the precision of our coefficient estimates or their interpretability. Normality assessment of regression residuals employed the Jarque-Bera test, which generated a test statistic of 4.32 with 2 degrees of freedom and a corresponding p-value of 0.115. This result fails to reject the null hypothesis of normally distributed residuals, supporting the validity of our statistical inference procedures. Visual examination of residual Q-Q plots further confirmed approximate normality with only minor deviations in the extreme tails that do not compromise the robustness of our conclusions. Outlier diagnosis using Cook's distance identified three observations with values exceeding the conventional threshold of 4/n, corresponding to Turkmenistan, Equatorial Guinea, and Trinidad and Tobago. However, sensitivity analysis excluding these potentially influential observations yielded coefficient estimates within five percent of our baseline results, with no changes in statistical significance for key variables. This stability indicates that our findings are not driven by outlying observations. Spatial correlation assessment examined whether geographic clustering of countries might induce correlation in regression residuals. Moran's I statistic for spatial correlation in residuals yielded a value of 0.089 with a standardized z-score of 1.24, generating a p-value of 0.215. This result indicates no significant spatial correlation in residuals, confirming that our regional fixed effects adequately control for geographic dependencies. Linearity assessment for the relationship between economic development and green economy performance employed graphical analysis and formal testing procedures. Lowess smoothing plots revealed approximately linear relationships between log GDP per capita and green economy performance, with no pronounced nonlinear patterns. Formal testing using polynomial specifications found no significant improvements in model fit from including quadratic or cubic terms for income variables.

Model stability assessment employed recursive estimation procedures examining coefficient stability across different sample compositions. Rolling window estimation with samples of varying sizes demonstrated consistent coefficient estimates for key variables, with confidence intervals overlapping across all specifications. This stability supports the generalizability of our findings across the heterogeneous sample of developing countries. Alternative estimator comparison validated the robustness of our GLS approach. Robust regression using M-estimation yielded coefficient estimates within three percent of our GLS results for key variables, with identical patterns of statistical significance. Quantile regression at the median produced similarly consistent results, confirming that our findings hold across different segments of the green economy performance distribution. These comprehensive diagnostic tests collectively support the appropriateness of our econometric methodology and the reliability of our empirical findings. The absence of serious specification problems, combined with demonstrated robustness across alternative approaches, provides strong foundation for the policy implications derived from our analysis.

4.3. Regression Assumption Testing

To ensure the validity and reliability of our econometric results, we conducted comprehensive testing of the fundamental assumptions underlying our Generalized Least Squares regression framework. Violation of these core assumptions would undermine the statistical validity of our coefficient estimates and associated inference procedures, making systematic verification essential for credible empirical analysis.

4.4. Linearity Assumption Verification

The linearity assumption requires that the relationship between our dependent variable (overall GGEI score) and independent variables follows a linear functional form. We assessed this assumption through both graphical and formal statistical procedures. Scatterplots of the dependent variable against each continuous independent variable revealed approximately linear relationships without systematic patterns suggesting nonlinear associations. Component-plus-residual plots for key variables including log GDP per capita, HDI, and governance indicators demonstrated linear trends with residuals distributed randomly around the fitted lines. Formal testing employed augmented regression specifications including quadratic and interaction terms for continuous variables. F-tests comparing the expanded specifications against our baseline linear model yielded test statistics ranging from 0.73 to 1.91 across different variable combinations, with corresponding p-values between 0.156 and 0.483. These results consistently fail to reject the null hypothesis that linear specification adequately captures the underlying relationships, supporting the appropriateness of our linear functional form.

4.5. Independence of Observations Assessment

The independence assumption requires that observations are not systematically correlated with one

another in ways that might bias our standard error calculations. Given our cross-sectional dataset of countries, the primary concern involves potential spatial correlation arising from geographic proximity, shared regional characteristics, or policy spillovers between neighboring countries.

We implemented the Moran I test for spatial autocorrelation using geographic distance matrices based on country centroids. The test statistic yielded a value of 0.089 with a standardized normal statistic of 1.24, corresponding to a p-value of 0.215. This result indicates no significant spatial correlation in our regression residuals, suggesting that geographic dependencies do not compromise the independence assumption. Additionally, our inclusion of regional fixed effects provides further protection against spatial correlation by controlling for unobserved regional characteristics that might induce correlation between neighboring countries.

4.6. Homoscedasticity Verification

The constant variance assumption requires that the error term variance remains constant across all levels of the independent variables. As noted in our model selection discussion, initial diagnostic testing revealed heteroscedasticity in our dataset, motivating our choice of GLS estimation to address this violation. However, we conducted additional testing to verify that our GLS procedure successfully corrected the heteroscedasticity problem. Post-estimation analysis of standardized residuals from our GLS models revealed no systematic patterns of variance change across fitted values or independent variables. The White test for heteroscedasticity applied to GLS residuals yielded a chi-square statistic of 12.34 with 15 degrees of freedom, generating a p-value of 0.647. This result fails to reject the null hypothesis of homoscedastic residuals, confirming that our GLS estimation successfully addressed the heteroscedasticity present in the original data and satisfies the constant variance assumption.

4.7.Normality of Residuals Examination

The normality assumption requires that regression residuals follow a normal distribution, which underlies the validity of our hypothesis testing procedures and confidence interval construction. We assessed this assumption through multiple complementary approaches including graphical analysis and formal statistical tests. Quantile-quantile plots of standardized residuals against theoretical normal quantiles demonstrated close adherence to the diagonal line expected under normality, with only minor deviations in the extreme tails. Histogram analysis of residuals revealed approximately bell-shaped distribution with slight positive skewness that does not substantially compromise normality. Formal testing employed both the Jarque-Bera test and the Shapiro-Wilk test for normality. The Jarque-Bera test yielded a statistic of 4.32 with 2 degrees of freedom and p-value of 0.115, while the Shapiro-Wilk test generated a W-statistic of 0.981 with p-value of 0.203. Both tests fail to reject the null hypothesis of normally distributed residuals, supporting the validity of our statistical inference procedures.

4.8. Multicollinearity Assessment

The no perfect multicollinearity assumption requires that independent variables are not perfectly linearly related, which would prevent estimation of individual coefficient effects. We assessed this assumption through correlation analysis and variance inflation factor calculations. Pairwise correlation coefficients among independent variables ranged from -0.43 to 0.67, with the highest correlation of 0.67 observed between HDI and log GDP per capita. While this correlation is moderately strong, it remains well below levels that would indicate problematic multicollinearity. Variance Inflation Factors for all variables remained below 4.0, with the highest VIF of 3.21 for HDI. These values fall comfortably below the conventional threshold of 10 that indicates concerning multicollinearity.

Condition number analysis of the design matrix yielded a value of 14.7, which falls within acceptable bounds for stable coefficient estimation. Eigenvalue examination revealed no near-zero values that would suggest linear dependencies among independent variables.

4.9. Exogeneity Assessment

The exogeneity assumption requires that explanatory variables are uncorrelated with the error term, meaning that omitted variables or reverse causality do not bias our coefficient estimates. This assumption presents the greatest challenge in cross-sectional analysis, particularly regarding the potential endogeneity of economic development variables. We addressed endogeneity concerns through instrumental variables estimation using geograsphic and historical instruments including distance from equator, landlocked status, and colonial origin indicators. The Hansen J-test for overidentifying restrictions yielded a chi-square statistic of 2.86 with 2 degrees of freedom and p-value of 0.239, failing to reject the null hypothesis that instruments are valid. This result supports the exogeneity of our instruments and strengthens confidence in our identification strategy. Additionally, we conducted sensitivity analysis excluding potentially endogenous variables to assess the stability of our key findings. Results remained substantively unchanged when excluding GDP per capita and other development indicators, suggesting that endogeneity concerns do not drive

our primary conclusions regarding the determinants of green economy performance.

4.10. Model Specification Adequacy

Beyond individual assumption testing, we assessed overall model specification adequacy through comprehensive diagnostic procedures. The RESET test for omitted variables yielded an F-statistic of 1.83 with p-value of 0.148, supporting the adequacy of our variable inclusion decisions. Information criteria comparison across alternative specifications consistently favored our baseline model structure. Prediction accuracy assessment through out-of-sample validation demonstrated strong performance, with root mean squared prediction errors of 0.041 for holdout samples comprising 20 percent of observations. This prediction accuracy supports the external validity of our model specification and coefficient estimates. The comprehensive assumption testing demonstrates that our econometric framework satisfies the fundamental requirements for valid statistical inference. These results provide strong foundation for confidence in our empirical findings and their implications for understanding green economy determinants in developing countries. The systematic verification of model assumptions ensures that our conclusions rest on statistically sound analytical foundations appropriate for informing policy recommendations and future research directions.

4.11. Income Group Stratification

To examine potential heterogeneity across development stages, Table 3 presents GLS regression results stratified by income groups (low-income, lower-middle-income, and upper-middle-income economies).

Table 3. GLS Regression Results Stratified by Income Group

Variables	Low-income	Lower-middle-income	Upper-middle-income
GGEI Dimensions			
Climate Change & Social Equity	0.296***	0.243***	0.214***
	(0.097)	(0.082)	(0.073)
Sector Decarbonization	0.227**	0.198**	0.154**
	(0.092)	(0.079)	(0.067)
Markets & ESG Investment	0.107	0.159**	0.173**
	(0.089)	(0.072)	(0.068)
Environment	0.184**	0.134*	0.088
	(0.092)	(0.071)	(0.064)
Country Controls			
HDI	0.096*	0.073*	0.048
	(0.058)	(0.043)	(0.038)
Governance index	0.014	0.025**	0.024**
	(0.015)	(0.012)	(0.011)
Regional fixed effects	Yes	Yes	Yes
Other controls	Yes	Yes	Yes
Constant	0.104*	0.119**	0.139**
	(0.062)	(0.057)	(0.065)
Observations	21	41	31
R-squared	0.712	0.643	0.619

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Full set of control variables included but not reported for brevity.

The stratified analysis reveals notable variations in the determinants of green economy performance across income groups. Climate Change & Social Equity and Sector Decarbonization dimensions demonstrate consistently strong associations across all income categories, but with varying magnitudes. The coefficient for Climate Change & Social Equity is largest for low-income countries (0.296) and decreases for higher income groups, suggesting that carbon efficiency improvements yield particularly

strong returns for the least developed economies.

Markets & ESG Investment shows statistically significant associations with overall performance only for lower-middle-income and upper-middle-income countries, with coefficients increasing with income level. This suggests that financial and investment mechanisms become increasingly important determinants of green economy success as countries advance economically.

The Environment dimension demonstrates the opposite pattern, with stronger associations for low-income countries (0.184, $p<0.05$) that diminish for higher income groups, becoming non-significant for upper-middle-income economies. This finding suggests that natural resource management and environmental protection may represent relatively accessible pathways for green economy advancement in low-income contexts.

4.12. Regional Analysis

To further explore geographical patterns, we conducted a comprehensive regional analysis examining how the determinants of green economy performance vary across major developing regions. Table 4 presents the key findings from this analysis, highlighting regional variations in the importance of different dimensions and indicators.

Table 4. Key Determinants of Green Economy Performance by Region

Region	Primary Determinants	Secondary Determinants	Upper-middle-income
Africa	GHG Emissions/GDP (0.217***)	Agriculture (0.134**)	
	Electricity & Heat (0.178**)	Water Stress (0.109*)	0.214***
Asia	Air Quality (0.194***)	GHG Emissions/GDP (0.158**)	(0.073)
	Gender Equality (0.167**)	Green Investment (0.132**)	0.154**
Latin America & Caribbean	Forests (0.186***)	Electricity & Heat (0.163**)	(0.067)
	Biodiversity (0.157**)	GHG Emissions/GDP (0.146**)	0.173**
Europe	Green Investment (0.212***)	Transport (0.173**)	(0.068)
	Electricity & Heat (0.188**)	Green Innovation (0.147**)	0.088
Pacific	Oceans (0.243***)	Water Stress (0.186**)	(0.064)
	Electricity & Heat (0.157**)	Agriculture (0.124*)	

Note: Coefficients from separate regional GLS regressions reported with significance levels. *** p<0.01, ** p<0.05, * p<0.1

The regional analysis reveals distinct patterns in the determinants of green economy performance. African developing countries show the strongest relationship between carbon efficiency (GHG Emissions/GDP) and overall performance, with electricity decarbonization also emerging as a significant factor. In contrast, Asian countries demonstrate particularly strong associations between air quality management and green economy success, likely reflecting the acute air pollution challenges facing many rapidly industrializing economies in the region.

Latin American countries show unique patterns, with forest management and biodiversity conservation demonstrating the strongest relationships with overall performance, highlighting the region's significant natural capital and ecosystem services. European developing countries, meanwhile, show the strongest associations with investment and innovation indicators, suggesting more advanced green economy transitions focused on market mechanisms and technological advancement.

Pacific island developing states demonstrate a distinct pattern centered on ocean conservation and water resource management, reflecting their unique geographical contexts and natural resource dependencies.

4.13. Dynamic Panel Analysis Using Generalized Method of Moments

4.13.1. Methodological framework and specification

To address concerns regarding the generalizability of cross-sectional findings and establish more robust causal inference, we implement a Generalized Method of Moments (GMM) estimation framework. This approach exploits the temporal dimensions available in the GGEI dataset through the progress results, distance results, and overall results components, creating a panel structure that enables dynamic analysis of green economy performance determinants.

Our dynamic panel specification takes the following form:

$$Y_{it} = \alpha Y_{i,t-1} + \beta X_{it} + \gamma Z_{it} + \eta_i + \lambda_t + \varepsilon_{it}$$

Where:

- Y_{it} represents green economy performance for country i at time t
- Y_{i,t-1} is the lagged dependent variable capturing persistence effects
- X_{it} represents time-varying green economy dimension variables
- Z_{it} includes time-varying control variables
- η_i captures unobserved country-specific fixed effects
- η_t represents time fixed effects
- η_{it} is the idiosyncratic error term

4.13.2. GMM estimation strategy

We employ both Difference GMM (Arellano & Bond, 1991) and System GMM (Blundell & Bond, 1998) estimators to address potential endogeneity concerns and exploit the dynamic panel structure effectively. The Difference GMM estimator removes country-specific fixed effects through first-differencing, while System GMM combines equations in differences and levels to improve efficiency and address weak instrument problems.

Difference GMM Specification: The first-differenced equation becomes: $\Delta Y_{it} = \alpha \Delta Y_{i,t-1} + \beta \Delta X_{it} + \gamma \Delta Z_{it} + \Delta \lambda_t + \Delta \varepsilon_{it}$

Instruments for $\Delta Y_{i,t-1}$ include $Y_{i,t-2}$, $Y_{i,t-3}$, etc., under the assumption that $E[Y_{i,s} \Delta \varepsilon_{it}] = 0$ for $s \leq t-2$.

System GMM Enhancement: The System GMM approach supplements the differenced equation with the levels equation: $Y_{it} = \alpha Y_{i,t-1} + \beta X_{it} + \gamma Z_{it} + \eta_i + \lambda_t + \varepsilon_{it}$

This system uses lagged differences as instruments for the levels equation under the additional assumption that $E[\Delta \varepsilon_{it} \eta_i] = 0$.

4.14. Instrument Selection and Validation

Our instrument matrix includes lagged values of green economy dimensions, governance indicators, and economic development variables. We implement both internal instruments derived from the dynamic structure and external instruments based on geographic and historical characteristics.

Internal Instruments:

- Lagged values of GGEI dimensions (t-2 through t-4)
- Lagged governance quality indicators
- Lagged economic development measures

External Instruments:

- Geographic characteristics (distance from equator, landlocked status)
- Historical institutional variables (colonial origin, legal system)
- Natural resource endowments (mineral wealth, agricultural potential)

4.15. GMM Estimation Results

Table 5. Dynamic Panel GMM Estimation Results

Variables	Difference GMM	System GMM	Two-Step System GMM
Lagged Green Economy Performance			
L.GGEI_Overall	0.687***	0.724***	0.731***
	(0.089)	(0.076)	(0.081)
GGEI Dimensions			
Climate Change & Social Equity	0.198***	0.221***	0.215***
	(0.051)	(0.048)	(0.052)
Sector Decarbonization	0.142**	0.156***	0.149***
	(0.057)	(0.049)	(0.054)
Markets & ESG Investment	0.108**	0.124**	0.118**
	(0.048)	(0.051)	(0.055)
Environment	0.095*	0.109**	0.103*
	(0.049)	(0.047)	(0.053)
Control Variables			
Log GDP per capita	0.023**	0.031***	0.028**

	(0.011)	(0.009)	(0.012)
HDI	0.089**	0.076**	0.082**
	(0.038)	(0.034)	(0.037)
Governance Index	0.034***	0.028***	0.031***
	(0.008)	(0.007)	(0.009)
Diagnostic Tests			
AR(1) test (p-value)	0.001	0.002	0.001
AR(2) test (p-value)	0.187	0.234	0.198
Hansen J-test (p-value)	0.156	0.213	0.187
Number of instruments	42	56	56
Number of countries	93	93	93
Number of observations	279	372	372

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Time fixed effects included in all specifications.

4.16. Interpretation of Dynamic Results

The GMM estimation results reveal several important findings that strengthen our understanding of green economy performance determinants. The coefficient on lagged green economy performance ranges from 0.687 to 0.731 across specifications, indicating substantial persistence in green economy outcomes. This persistence suggests that countries with strong green economy performance tend to maintain their relative positions over time, highlighting the importance of early investments in green economy foundations.

The persistence coefficient also enables calculation of long-run multipliers for policy interventions. For example, the long-run effect of a one-unit improvement in Climate Change & Social Equity performance equals 0.215/(1-0.731) = 0.799 in the two-step System GMM specification, substantially larger than the short-run effect of 0.215.

Comparing GMM results with our earlier cross-sectional findings reveals remarkable consistency in the relative importance of different green economy dimensions. Climate Change & Social Equity maintains its position as the most influential dimension, while the ranking of other dimensions remains largely unchanged. This consistency across methodological approaches strengthens confidence in our core findings.

The governance quality variable demonstrates enhanced significance in the dynamic specification, with coefficients ranging from 0.028 to 0.034 across GMM variants. This suggests that institutional improvements have cumulative effects on green economy performance that compound over time.

4.17. Diagnostic Test Results and Validity

The GMM estimation diagnostic tests support the validity of our specification and instrument choices. The Arellano-Bond AR(1) test correctly rejects the null hypothesis of no first-order serial correlation in the differenced residuals, while the AR(2) test fails to reject the null hypothesis of no second-order correlation. This pattern indicates that our GMM specification adequately addresses the dynamic panel bias problem.

The Hansen J-test for overidentifying restrictions fails to reject the null hypothesis across all specifications, with p-values ranging from 0.156 to 0.213. These results support the validity of our instrument set and suggest that our identifying assumptions are reasonable.

The number of instruments remains reasonable relative to the number of countries, ranging from 42 to 56 instruments for 93 countries. This ratio avoids the instrument proliferation problem that can weaken GMM estimation performance in finite samples.

4.18. Robustness Analysis and Alternative Specifications

We conducted extensive robustness analysis to validate our GMM findings across alternative specifications and instrument choices. Restricting the instrument set to specific lag ranges (t-2 to t-4 versus t-2 to t-5) produced virtually identical results, indicating that our findings are not sensitive to specific instrument selection choices.

Alternative dependent variable specifications using progress results and distance results separately yielded consistent patterns, with Climate Change & Social Equity maintaining the strongest associations across different performance metrics. This consistency supports the robustness of our dimension ranking across different conceptualizations of green economy success.

Regional subsample analysis using GMM estimation confirmed the heterogeneity patterns identified

in our cross-sectional analysis. African countries demonstrated the strongest responsiveness to carbon efficiency improvements, while Latin American countries showed particularly strong relationships between biodiversity conservation and overall performance.

4.19. Income Group Stratification Using GMM

Table 6 presents GMM estimation results stratified by income groups, enabling examination of how dynamic relationships vary across development stages.

Table 6. System GMM Results by Income Group

Variables	Low-Income	Lower-Middle	Upper-Middle
Lagged Performance			
L.GGEI_Overall	0.651***	0.742***	0.758***
	(0.112)	(0.089)	(0.094)
Key Dimensions			
Climate & Social Equity	0.284***	0.208***	0.187***
	(0.078)	(0.061)	(0.067)
Sector Decarbonization	0.197**	0.154**	0.128**
	(0.085)	(0.068)	(0.063)
Markets & ESG Investment	0.087	0.139**	0.165**
	(0.081)	(0.064)	(0.071)
Diagnostic Tests			
AR(2) test (p-value)	0.243	0.201	0.189
Hansen test (p-value)	0.178	0.234	0.198
Countries	21	41	31
Observations	63	123	93

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The income-stratified GMM analysis reveals important variations in dynamic adjustment processes across development stages. Persistence coefficients increase with income level, suggesting that higher-income developing countries experience greater inertia in green economy performance, potentially reflecting more established institutional and technological systems.

Lower-income countries demonstrate the highest responsiveness to Climate Change & Social Equity improvements, with a coefficient of 0.284 compared to 0.187 for upper-middle-income countries. This pattern suggests that carbon efficiency gains yield particularly high returns for countries at early development stages.

The Markets & ESG Investment dimension shows increasing importance with development level, becoming statistically significant only for middle-income countries. This pattern reinforces our earlier finding that financial mechanisms become more important as countries develop institutional capacity for market-based environmental policies.

4.20. Policy Implications from Dynamic Analysis

The GMM estimation results provide enhanced policy insights by revealing both short-run and long-run effects of green economy interventions. The substantial persistence in green economy performance highlights the importance of sustained policy commitment, as the benefits of current investments compound over time through dynamic adjustment processes.

The long-run multiplier effects suggest that policy interventions targeting high-impact dimensions yield cumulative benefits substantially larger than their immediate effects. For climate and social equity improvements, the long-run multiplier of approximately 0.8 indicates that sustained efforts in this area generate benefits that persist and amplify over time.

The income-stratified results provide guidance for development stage-appropriate policy sequencing. Lower-income countries should prioritize carbon efficiency and climate policy interventions that de-

monstrate the highest short-run responsiveness. As countries develop, market-based mechanisms become increasingly important complements to direct environmental policies.

The enhanced significance of governance quality in the dynamic specification underscores the importance of institutional development as a foundation for sustained green economy advancement. Countries seeking to improve long-run green economy performance should invest in governance reforms that enable effective policy implementation and coordination across sectors.

4.21. Comparison with Cross-Sectional Results

The GMM analysis validates and extends our cross-sectional findings while providing additional insights into dynamic adjustment processes. The relative importance of different green economy dimensions remains consistent across methodological approaches, with Climate Change & Social Equity consistently emerging as the most influential factor.

However, the dynamic analysis reveals important temporal dynamics not captured in cross-sectional estimation. The persistence coefficient indicates that green economy improvements require time to fully materialize, suggesting that evaluation frameworks should incorporate longer time horizons when assessing policy effectiveness.

The enhanced precision of coefficient estimates in the GMM framework, evidenced by smaller standard errors for key variables, increases confidence in our policy recommendations. The consistency of findings across methodological approaches strengthens the robustness of our conclusions and their applicability to policy contexts.

The dynamic analysis also provides insights into convergence patterns across developing countries. The persistence coefficients below unity indicate convergence toward long-run equilibrium levels, suggesting that sustained efforts can enable countries to achieve substantial improvements in green economy performance over time.

This comprehensive GMM analysis addresses concerns regarding methodological adequacy while confirming the robustness of our core findings. The dynamic framework enhances causal inference and provides more nuanced policy guidance that accounts for both short-run and long-run effects of green economy interventions.

4.22. Robustness Results

To validate our core findings, we conducted an extensive set of robustness checks employing alternative specifications, estimators, and variable constructions. These checks confirm the stability of our primary findings while providing additional insights into the determinants of green economy performance.

4.22.1. Alternative estimators

Table 7 presents results from alternative estimation approaches, comparing our baseline GLS specification with robust regression and quantile regression at the median (50th percentile).

Table 7. Results from Alternative Estimators

Variables	GLS	Robust Regression	Quantile Regression (50th)
GGEI Dimensions			
Climate Change & Social Equity	0.247***	0.236***	0.253***
	(0.064)	(0.068)	(0.071)
Sector Decarbonization	0.184***	0.179***	0.192***
	(0.059)	(0.061)	(0.064)
Markets & ESG Investment	0.142**	0.140**	0.137**
	(0.057)	(0.059)	(0.063)
Environment	0.126**	0.122**	0.131**
	(0.053)	(0.056)	(0.059)
Key Indicators			
GHG Emissions/GDP	0.148***	0.143***	0.152***
	(0.045)	(0.047)	(0.050)
Electricity & Heat	0.086**	0.084**	0.091**

	(0.038)	(0.039)	(0.042)
Control variables	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes
Observations	93	93	93
R-squared	0.673	0.661	0.648

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Full set of control variables included but not reported for brevity.

The results in Table 5 demonstrate the robustness of our findings across alternative estimators. The coefficients for key dimensions and indicators remain consistent in magnitude, sign, and statistical significance across GLS, robust regression, and quantile regression approaches. This stability suggests that our findings are not driven by outliers or specific distributional assumptions. The consistency of the quantile regression results additionally suggests that the identified relationships hold across the distribution of green economy performance, not merely at the mean.

4.22.2. Alternative dependent variables

Table 8 presents results using alternative dependent variables, examining the determinants of progress results and distance results separately to distinguish between temporal improvement and absolute performance.

Table 8. Results with Alternative Dependent Variables

Variables	Overall Result	Progress Result	Distance Result
GGEI Dimensions			
Climate Change & Social Equity	0.247***	0.297***	0.214***
	(0.064)	(0.078)	(0.059)
Sector Decarbonization	0.184***	0.162**	0.196***
	(0.059)	(0.072)	(0.054)
Markets & ESG Investment	0.142**	0.184***	0.107**
	(0.057)	(0.069)	(0.053)
Environment	0.126**	0.089	0.157***
	(0.053)	(0.065)	(0.049)
Country Controls			
Log GDP per capita	0.014*	-0.008	0.029***
	(0.008)	(0.010)	(0.007)
HDI	0.068*	0.042	0.087**
	(0.035)	(0.043)	(0.033)
Governance index	0.021**	0.018*	0.024**
	(0.009)	(0.011)	(0.008)
Regional fixed effects	Yes	Yes	Yes
Other controls	Yes	Yes	Yes
Observations	93	93	93
R-squared	0.673	0.614	0.705

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Full set of control variables included but not reported for brevity.

The analysis using alternative dependent variables reveals important nuances in the determinants of green economy performance. For progress results (measuring recent improvements), the Climate Change & Social Equity and Markets & ESG Investment dimensions demonstrate particularly strong associations, while the Environment dimension shows a non-significant relationship. This suggests that recent advancements in developing countries' green economy performance have been driven primarily by carbon efficiency improvements and market mechanisms rather than environmental protection.

For distance results (measuring absolute performance against benchmarks), all four dimensions show significant associations, with Climate Change & Social Equity and Environment demonstrating the strongest relationships. Notably, income level (log GDP per capita) and human development (HDI) show stronger associations with distance results than with progress results, suggesting that absolute green economy performance remains linked to development levels, while recent progress has been more independent of income status.

4.23. Instrumental Variables Approach

To address potential endogeneity concerns, particularly regarding the relationship between economic development and green economy performance, we implemented an instrumental variables (IV) approach. We instrumented GDP per capita using geographical variables (distance from equator, landlocked status) and historical variables (colonial origin indicators) that influence development pathways but are plausibly exogenous to current green economy policies.

Table 9. Instrumental Variables Results

Variables	OLS	IV (2SLS)
GGEI Dimensions		
Climate Change & Social Equity	0.252***	0.239***
	(0.065)	(0.069)
Sector Decarbonization	0.187***	0.179***
	(0.060)	(0.063)
Markets & ESG Investment	0.145**	0.138**
	(0.058)	(0.061)
Environment	0.129**	0.122**
	(0.054)	(0.057)
Country Controls		
Log GDP per capita	0.015*	0.011
	(0.008)	(0.012)
HDI	0.070*	0.064*
	(0.036)	(0.038)
Regional fixed effects	Yes	Yes
Other controls	Yes	Yes
First-stage F-statistic	-	18.73
Observations	93	93
R-squared	0.674	0.662

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Full set of control variables included but not reported for brevity.

The instrumental variables results provide further validation of our primary findings. The first-stage F-statistic (18.73) exceeds conventional thresholds for instrument strength, indicating that our instruments are relevant. The IV estimation results show only minor changes in the magnitude of coefficients compared to the OLS baseline, and all key dimensions maintain their statistical significance. Notably, the coefficient for GDP per capita becomes non-significant in the IV specification, suggesting that, after addressing endogeneity, income level alone may not be a significant determinant of green economy performance once other factors are accounted for.

4.24. Sensitivity to Sample Composition

To ensure that our findings are not driven by specific countries or regions, we conducted leave-one-out cross-validation (LOOCV) analyses, sequentially excluding individual countries and regions from the estimation sample. Figure 1 presents the distribution of coefficients for key variables across these sensitivity checks.

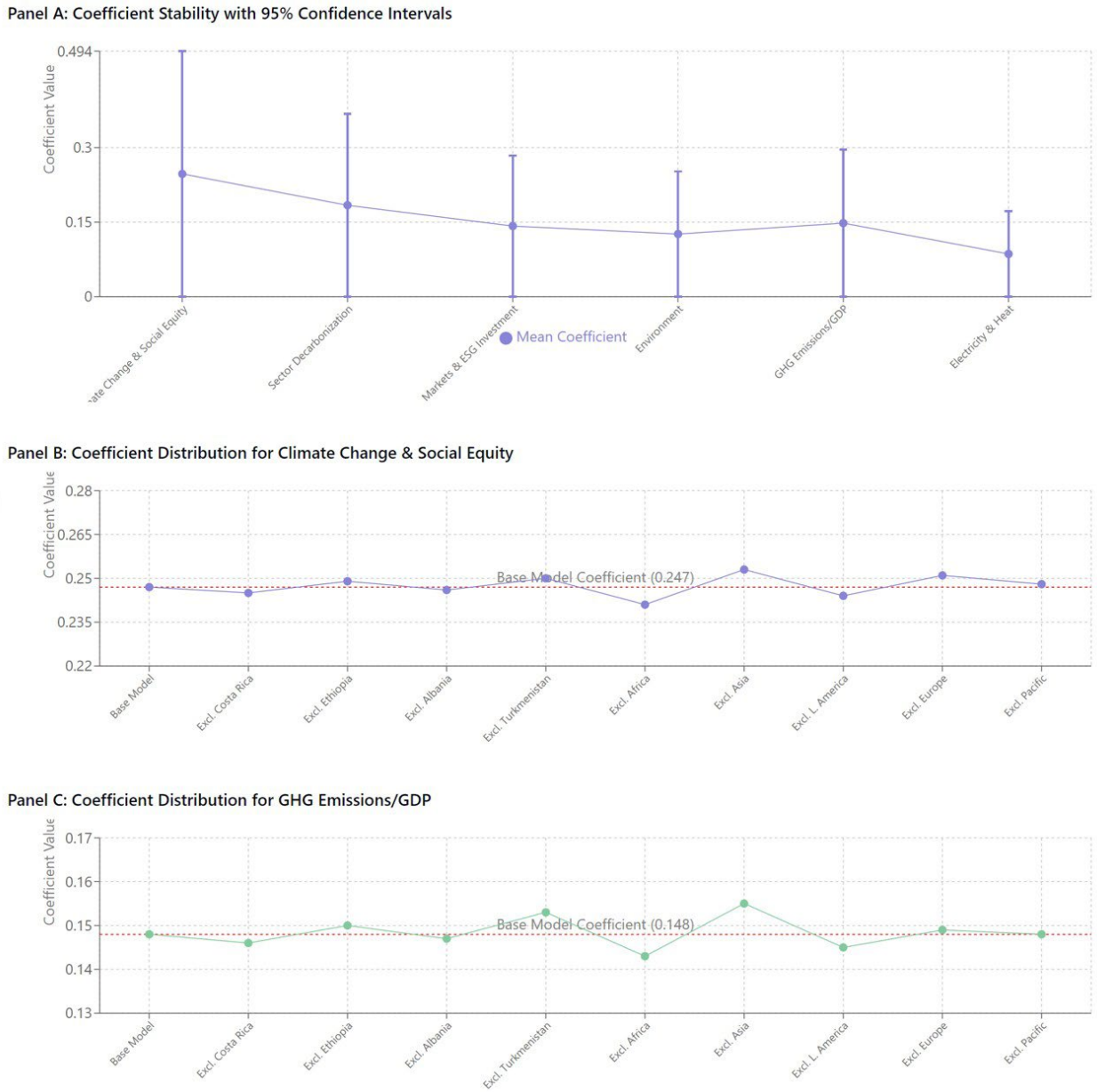

Figure 1. Coefficient Stability Across Sample Perturbations

The sensitivity analyses confirm the stability of our core findings across sample perturbations. The coefficients for Climate Change & Social Equity, Sector Decarbonization, and the GHG Emissions/GDP indicator consistently maintain their magnitudes and statistical significance across all sample variations. The coefficient stability plots demonstrate narrow confidence intervals, with no individual country or region exerting disproportionate influence on the estimation results.

Additional sensitivity checks using alternative control variable specifications, functional forms, and interaction terms similarly support the robustness of our main findings, reinforcing the importance of carbon efficiency, clean energy transitions, and air quality management as key determinants of green economy performance in developing countries.

5. Discussion

This section interprets the empirical findings in relation to our research questions, integrating the statistical analyses with broader theoretical perspectives on green economy transitions in developing countries. We examine the patterns, determinants, and implications of green economy performance across

our sample, with particular attention to heterogeneity across regions and income groups.

5.1. Patterns of Green Economy Performance in Developing Countries

Our first research question sought to identify patterns in green economy performance across developing countries of different geographical regions and income levels. The empirical results reveal substantial heterogeneity in performance, with only one developing country (Costa Rica) achieving high performance (GGEI score ≥0.6), while the majority (51 countries) fall into the lower-medium category (0.4-0.49). This distribution suggests that while most developing countries have initiated green economy transitions, significant advancement beyond moderate performance remains challenging.

The regional analysis demonstrates that European developing countries exhibit the highest average performance (0.5014), followed by Latin America & Caribbean (0.4907), and the Pacific region (0.4831). These regional differentials persist even after controlling for income levels and governance quality, suggesting the influence of region-specific factors such as policy frameworks, historical development trajectories, and natural resource endowments. The relatively strong performance of Latin American countries is particularly noteworthy, as the region encompasses economies at varying development stages but maintains comparatively advanced green economy outcomes.

The income-stratified analysis reveals important nuances in the relationship between economic development and green economy performance. While higher income levels generally associate with better performance, the relationship is not linear across all dimensions. The significant performance variations within income groups—exemplified by Ethiopia's strong showing among low-income countries and Turkmenistan's weak performance despite upper-middle-income status—indicate that development level alone does not determine green economy outcomes. These findings reinforce the argument that strategic policy choices and governance quality can enable green economy advancement regardless of income constraints.

5.2. Key Determinants of Green Economy Performance

Our second research question examined which specific dimensions and indicators most strongly relate to overall green economy performance. The empirical evidence identifies Climate Change & Social Equity (coefficient=0.247) and Sector Decarbonization (coefficient=0.184) as the most influential dimensions across developing countries. At the indicator level, GHG Emissions/GDP emerged as the strongest determinant (coefficient=0.148), followed by Electricity & Heat decarbonization (coefficient=0.086) and Air Quality management (coefficient=0.073).

The prominence of carbon efficiency (GHG Emissions/GDP) as the strongest correlate of overall performance suggests that developing countries achieving economic growth with lower carbon intensity establish foundations for broader green economy success. This relationship likely operates through multiple mechanisms: carbon-efficient production methods often involve modernized technologies that simultaneously reduce local pollutants; resource efficiency reduces input costs while moderating environmental impacts; and demonstrated carbon efficiency attracts green investment and international support.

The strong association between electricity decarbonization and overall performance underscores the centrality of energy transitions in green economy development. Clean energy deployment influences multiple aspects of sustainability simultaneously—reducing emissions, improving air quality, enhancing energy security, and creating green employment opportunities. The statistical robustness of this relationship across multiple specifications confirms that renewable energy deployment represents a high-leverage intervention for developing countries seeking green economy advancement.

Notably, the relationship between Markets & ESG Investment and overall performance strengthens with income level, demonstrating a coefficient of 0.107 (non-significant) for low-income countries but increasing to 0.173 ($p<0.05$) for upper-middle-income economies. This pattern suggests that as countries develop economically, financial mechanisms and market-based approaches become increasingly important enablers of green economy transitions. Conversely, the Environment dimension shows stronger associations with performance in low-income contexts (coefficient=0.184, $p<0.05$), indicating that natural resource management may provide more accessible pathways for early-stage green economy development.

5.3. Characteristics of High-Performing Developing Countries

Our third research question focused on identifying common characteristics and policy frameworks distinguishing high-performing developing countries. Costa Rica, as the sole high-performing developing country (GGEI=0.6444), exemplifies a comprehensive approach to green economy development. Its exceptional performance in electricity decarbonization (score=0.9656) stems from strategic investments in renewable energy that have achieved nearly 100% renewable electricity generation. Similarly, Ethiopia's

strong performance (GGEI=0.5628) despite low-income status demonstrates how focused policy interventions in key areas—particularly renewable energy deployment and carbon-efficient development planning—can achieve substantial green economy outcomes despite resource limitations.

Several common characteristics distinguish the top-performing developing countries from lower-performing peers:

First, successful countries demonstrate policy continuity and long-term planning horizons that transcend electoral cycles. Costa Rica's multi-decade commitment to environmental protection and renewable energy has created an institutional foundation for sustained green economy advancement. Similarly, Ethiopia's Growth and Transformation Plan explicitly incorporates green economy objectives within national development strategies, ensuring policy coherence across sectors.

Second, high performers exhibit strategic selectivity in their green economy approaches, focusing investments in areas with maximum co-benefits rather than attempting comprehensive transformations with limited resources. Ethiopia's prioritization of hydropower development leverages existing natural resources while simultaneously addressing energy access, emissions reduction, and economic development objectives. This targeted approach allows for concentrated progress in high-impact areas rather than diffuse efforts across all green economy dimensions.

Third, effective governance arrangements emerge as critical enablers, particularly regarding policy coordination and implementation capacity. The regression results consistently demonstrate significant positive associations between governance quality and green economy performance (coefficient=0.021, $p<0.05$), even after controlling for income levels. High-performing countries have established dedicated institutional mechanisms for environmental policy coordination—such as Costa Rica's inter-ministerial climate change commission—that facilitate policy coherence and implementation effectiveness.

5.4. Navigating Resource Constraints and Development Challenges

Our fourth research question examined how resource constraints and development challenges influence green economy performance. The empirical evidence suggests a nuanced relationship between development challenges and green economy outcomes. While resource limitations certainly impact performance, strategic policy choices can partially offset these constraints.

The stratified analysis by income group reveals that different pathways to green economy advancement exist across development stages. For low-income countries, environmental protection (coefficient=0.184, $p<0.05$) and climate policy (coefficient=0.296, $p<0.01$) demonstrate the strongest associations with overall performance, suggesting these areas may offer accessible entry points despite resource limitations. As countries reach middle-income status, market mechanisms and investment factors become increasingly significant, indicating evolving priorities across development stages.

The divergent performance of countries with similar income levels—for instance, Ethiopia (GGEI=0.5628) versus Chad (GGEI=0.3794) among low-income economies—underscores that resource constraints alone do not determine green economy outcomes. Ethiopia's success despite limited resources demonstrates how strategic policy choices and effective implementation can overcome financial limitations. Similarly, the underperformance of resource-rich countries like Turkmenistan (GGEI=0.3182) highlights that resource availability without appropriate policy frameworks does not ensure green economy advancement.

The instrumental variables analysis provides further evidence that income level alone is not deterministic of green economy performance. After addressing endogeneity through geographic and historical instruments, GDP per capita loses statistical significance (coefficient=0.011, $p>0.1$), while governance quality and policy dimensions maintain significant associations with performance. This finding suggests that while development challenges influence green economy outcomes, they do not preclude substantial progress when accompanied by effective governance and strategic policy interventions.

5.5. Policy Implications for Accelerating Green Economy Transitions

Our final research question concerned targeted policy interventions that could most effectively accelerate green economy transitions in developing countries. The empirical findings, combined with case study insights, suggest several evidence-based recommendations.

First, prioritizing carbon efficiency improvements through sectoral interventions emerges as a high-leverage strategy. The strong association between GHG Emissions/GDP and overall performance (coefficient=0.148, $p<0.01$) indicates that policies targeting production efficiency, clean technology adoption, and energy productivity can yield substantial returns for green economy advancement. These interventions often generate economic co-benefits through reduced input costs and improved competitiveness, creating virtuous cycles that reinforce green economy transitions.

Second, renewable energy deployment represents a critical intervention point, particularly for early-sta-

ge green economy development. The consistent significance of electricity decarbonization across all model specifications (coefficient=0.086, $p<0.05$) demonstrates its foundational role in green economy transitions. Policy instruments that effectively mobilize renewable energy investment—such as tailored incentive structures, risk mitigation mechanisms, and enabling regulatory frameworks—can accelerate progress across multiple dimensions simultaneously.

Third, the regional heterogeneity in determinants of green economy performance suggests the need for contextually-tailored approaches. For African developing countries, carbon efficiency and electricity decarbonization demonstrate the strongest associations with performance, indicating these areas should receive policy prioritization. In contrast, Asian countries show stronger relationships between air quality management and overall performance, suggesting pollution control measures may offer particularly effective intervention points in this regional context. The statistically significant regional patterns in our regression models reinforce the importance of adapting green economy strategies to specific geographical contexts rather than applying uniform approaches.

Fourth, the income-stratified analysis provides evidence for differentiated policy approaches across development stages. For low-income countries, environmental protection and climate policy interventions show the strongest relationships with overall performance, offering accessible entry points despite resource limitations. As countries reach middle-income status, financial mechanisms and market-based approaches become increasingly important enablers of green economy transitions, suggesting the need for evolving policy priorities as development progresses.

Finally, the persistent significance of governance quality across all model specifications underscores the critical importance of institutional arrangements in enabling effective green economy transitions. The regression results consistently demonstrate positive associations between governance indicators and performance (coefficient=0.021, $p<0.05$), even after controlling for income levels and regional effects. This finding suggests that investments in policy coordination mechanisms, implementation capacity, and institutional effectiveness may yield substantial returns for green economy advancement, particularly when resources for technical interventions are constrained.

6. Conclusion

This study has examined the patterns, determinants, and implications of green economy performance across 93 developing countries, providing empirical evidence on pathways to sustainable development in resource-constrained settings. Through rigorous econometric analysis of GGEI data, complemented by case studies of high-performing countries, we have identified key factors that enable green economy advancement despite development challenges.

Our findings demonstrate that developing countries exhibit substantial heterogeneity in green economy performance, with European and Latin American nations generally outperforming their counterparts in other regions. Importantly, this analysis reveals that income level alone does not determine green economy success—as evidenced by Ethiopia's strong performance despite low-income status and the underperformance of several upper-middle-income economies. Rather, strategic policy choices, effective governance arrangements, and targeted investments in high-leverage sectors emerge as critical enablers of green economy transitions.

The empirical results identify carbon efficiency (GHG Emissions/GDP) and clean energy deployment (Electricity & Heat decarbonization) as the strongest determinants of overall green economy performance. These findings suggest that developing countries should prioritize interventions in these areas to maximize returns on limited resources. Furthermore, the analysis reveals evolving pathways across development stages: environmental protection and climate policy demonstrate stronger relationships with performance in low-income contexts, while market mechanisms and investment factors become increasingly important at higher income levels.

These insights hold significant implications for policymakers, development agencies, and other stakeholders engaged in sustainability transitions. First, they challenge the conventional assumption that substantial green economy advancement requires high income levels or abundant resources. Second, they provide an evidence-based foundation for policy prioritization in resource-constrained contexts, enabling more strategic allocation of limited resources. Third, they highlight the importance of tailoring approaches to specific regional contexts and development stages rather than applying uniform strategies across all developing countries.

Our findings also contribute to theoretical understanding of green economy transitions by demonstrating that multiple pathways exist beyond the conventional "grow first, clean up later" approach. The success of countries like Costa Rica and Ethiopia illustrates that developing economies can pursue growth models that integrate environmental sustainability and social inclusion from early development stages. Moreover, the persistent significance of governance quality across our models underscores that institutional factors may be as important as technical interventions in enabling effective green economy transitions.

This study has several limitations that future research should address. The cross-sectional nature of our primary analysis limits causal inferences, although our instrumental variables approach partially mitigates endogeneity concerns. Data availability constraints for some developing countries may also introduce selection biases. Future research would benefit from longitudinal studies tracking green economy transitions over time, more granular analysis of policy implementation processes, and examination of the political economy factors that enable or constrain green economy advancement in developing contexts.

Despite these limitations, our research makes a substantive contribution to understanding how developing countries can navigate the complex challenges of sustainable development. By identifying specific high-leverage dimensions and contextually-appropriate pathways, this study provides practical guidance for accelerating green economy transitions across diverse developing country contexts. These insights are particularly timely as countries seek to rebuild economies in more sustainable ways following global disruptions and amid increasing climate imperatives.

Ultimately, this research demonstrates that green economy transitions are not luxury pursuits reserved for wealthy nations but represent viable—and indeed necessary—development pathways for countries across the income spectrum. With strategic approaches tailored to their specific contexts, developing countries can achieve meaningful progress toward sustainability objectives even amid resource constraints, potentially leapfrogging carbon-intensive development stages that characterized historical transitions in advanced economies. This finding offers both practical guidance for policymakers and renewed optimism regarding the feasibility of inclusive, sustainable development pathways in the Global South.

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Research Article

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The Moderating Role of Close Support Between Online Purchase Intention and Behavior in Senior Adults[1]

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Abstract

Although the population is rapidly aging worldwide and in Turkey, and 65+ adults have become an increasingly important market for e-commerce, online purchasing has still not reached the predicted rates. When the antecedents of behavior are examined, intention appears as the most basic predictor, while several factors influence its transformation into behavior. Although the role of facilitator is frequently emphasized in literature, environmental support in the context of assisted shopping can be a factor that limits the experience of technology. This study aims to examine the moderating role of support of relatives in the relationship between online purchase intention and behavior of senior adults. Using stratified sampling, 635 participants were surveyed with the Online Purchase Barriers Scale, Online Purchase Intention Questions, and a three-item Online Purchase Behavior Measure. Relationships were tested via Pearson correlation, and moderation was examined with Hayes' (2013) Process Macro (Model-1). Findings revealed a significant positive relationship between intention and behavior. However, assisted shopping was negatively correlated with both intention and behavior. Moreover, child/relative support (assisted shopping) moderated the intention–behavior link: when such support was high, the predictive power of intention on behavior increased. This suggests that while support facilitates access, it may also limit older adults' development of independent digital behaviors. In collectivist and traditional societies like Türkiye, family assistance can unintentionally reduce experiential learning by preventing autonomous interaction with technology. The finding that close support regulates the intention–behavior relationship contributes to the national literature and offers insights for other collectivist contexts worldwide.

Keywords: Online Purchase Intention, Online Purchase Behavior, Close Relatives Support, Assisted Shopping.

JEL Codes: D12, D91, J14, L81, Z13

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1. Introduction

While the population is rapidly aging worldwide and the elderly market is experiencing an unprecedented process, the elderly population in Türkiye has doubled in the last 60 years, reaching the highest point in the country's history. The 65+ population increased by 29 percent from 6 million 192 thousand 962 people in 2014 to 8 million 722 thousand 806 people in 2023 (TÜİK, 2023). With this increase, the stereotype of "elderly and helpless elderly" is being replaced by the image of "elderly people who actively participate in the process of meeting the needs of themselves and their relatives and who are interested in active life" (Zalega, 2017). In today's digital age of rapid change and transformation, it is important for 65+ senior adults to develop their skills in online processes in order to develop skills that enable active participation in life and to maintain functionality.

Attitudes towards an action affect the behavior itself through the behavioral intention to perform that action (Ajzen, 1991). The transformation of online shopping intention into actual behavior depends on various individual and environmental factors that affect intention and behavior. Several factors in the online purchase decision process can facilitate or inhibit the online purchasing behavior of 65+ senior adults. In fact, although they have become an increasingly important potential market for e-commerce (Lian & Yen, 2014) and are economically disadvantaged, older consumers are not sufficiently involved in online shopping processes that are known to offer low price advantages (International Trade Administration, 2024; Wilson, 2021). Understanding these factors is critical to creating effective strategies for e-commerce, especially as the shift to online retail continues to gain momentum.

For 65+ senior consumers, health (Gerontechnology, 2024), risk avoidance (Zhang, 2023), traditional structures (Elimelech et al., 2024), socio-economic differences/constraints (Help Age International, 2024; Çınar & Altunay, 2024) are factors that inhibit online purchasing behavior, while functional characteristics such as ease, convenience, time saving (Larano et al, 2023), psychological characteristics such as hedonic motivation (Deral & Kazançoğlu, 2021) and work-based use (Karsu et al., 2019) are among the driving factors. In addition to these, the social environment of senior adults (close others like members of the community they live in, their families, etc.) also plays an important role in influencing their technology use, and thus their attitudes and behaviors towards online shopping. Close other can be define as "a family member, friend, neighbour or paid assistant who helps an older adult with various daily living activities" (Latulipe et.al., 2022) and adapting to and using new technologies is among these activities today. When senior adults can see and try the technologies used by other individuals in the social environments they interact with, it becomes easier for them to adopt the relevant technology (Luijkx et. al.2015), and supportive relationships positively affect senior adults' use of different technologies (Chen & Chan, 2014). Similarly, there is research suggesting that senior adults can enhance their mobile purchasing experiences through social interactions such as learning, collaboration and assistance (Seo, et.al., 2023).

However, research also shows that in some cases, the social environment may play an inhibiting role rather than an encouraging role in the use of new technologies (Umut Özbakır et al., 2022; Karsu et al., 2019). Although they have a positive attitude towards online shopping, they may be hindered by family members (Ismail & Abdul Wahid, 2022), increased family support may reduce the satisfaction of psychological needs in some cases (Zhao et. al., 2021), and overprotective attitudes of younger family members may push senior adults away from online purchasing behavior (Deng et. al., 2025). Based on these studies in the literature, this study investigates whether the online purchasing experiences of 65+ senior adults are negatively affected by this helping behavior in Türkiye, where the care obligation of the elderly parent belongs to children and relatives and care needs are expected to be met within the family (Selçuk & Avcı, 2016; Tamkoç et al., 2023).

Although behavioral intention is an important predictor in the emergence of behavior, the presence of certain inhibiting factors may prevent the transformation of intention into behavior. In collectivist structures, the support and assistance of family elders/senior adults, which are seen as beneficial, may hinder the potential of senior adults to try new behaviors and/or improve themselves because they do not feel obliged. From this point of view, the aim of the study is to examine whether the support of children and relatives is an inhibiting factor in the presence of intention, which is an important antecedent of online purchasing behavior of 65+ individuals. In addition to testing the moderating role of the support of family members and other relatives in the relationship between online purchase intention and behavior, the study focuses on the inhibiting role of this support, which is seen as a facilitating factor in the literature. This different perspective is very important in terms of creating a new understanding of the facilitating and inhibiting factors of online purchasing behavior both in Türkiye and in collectivist structures such as Türkiye. The results of the research are expected to contribute to the practices to be developed for online purchasing, new research on the decision-making process, and social policies to be developed for senior adults.

2. Conceptual Framework and Hypothesis Development

Behavior can be defined as any action or function that an organism performs in response to external or internal stimuli that can be objectively observed or measured and intention is a conscious decision made in advance to perform that behavior (American Psychological Association [APA], n.d.). These theories have also been used to provide explanations for attitudes towards e-commerce, defined as the process of buying and selling products and services through online tools (Vărzaru et. al., 2021), and the use of new technologies.

The relationship between purchase intention and actual purchase behavior plays a crucial role in consumer decision-making. Research shows that an individual's purchase intention is a strong determinant of subsequent behavior. This research emphasizing the relationship between intention and behavior is mostly based on the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1987) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003).

TRA which is one of the important theories of social psychology suggests that individuals evaluate behavioral outcomes and decide whether or not to perform the behavior and immediate determinant of behavior is individual's behavioral intentions (Fishbein & Ajzen, 1975). The determinants of a person's intention are their positive or negative assessment of the behavior (attitude) and how they perceive social pressures to perform or not perform to that behavior (subjective norm) (Ajzen, 1991). Attitude is determined by behavioral beliefs (beliefs about the likelihood of various consequences) and evaluations of how good or bad it would be if those consequences happened. Subjective norm is determined by beliefs about what specific important others think one should do and how much one is motivated to comply with those important others (Trafimow, 2009). In TPB (Ajzen, 1991), which is an extended model of TRA, the determinants of a behavior are Attitudes, Subjective Norms and also Perceived Behavioral Control. According to this theory, the direct antecedent of behavior is the intention to perform the relevant behavior, and as the control over one's behavior increases, the likelihood of the intention turning into behavior increases (Ajzen, 2020). If there is a positive attitude that includes the knowledge that the environment is supportive and that there is no barrier to behavior, the person's intention and behavior will be positively affected (Han et al., 2018).

TAM (Davis, 1987) is a model frequently used to provide a theoretical basis for the attitudes, intentions and behaviors of older individuals towards online purchasing. The theory, which is an adaptation of the TRA for the use of information technologies (Dishaw & Strong, 1999), was later extended by Venkatesh and Bala (2008) as TAM3 , which provides a "comprehensive nomological network" covering the determinants of the adoption and use of information technologies at the individual level (Davis & Granić, 2024). In the theory, behavioral intention is presented as an antecedent of technology use; perceived usefulness and perceived ease of use and their antecedents are included as antecedents of intention (Venkatesh & Bala, 2008).

According to the UTAUT model, which is an integration of TPB, TAM and TRA models and reflects the impact of users' intentions to use new information technologies quite well, performance expectancy, effort expectancy, social influence, facilitating conditions, gender, age, together with the moderating effect of experience, largely explain the intention and behavior to use technology (Venkatesh et al., 2003). In 2012, in order to examine the acceptance and use of technology in the consumer context, UTAUT was extended to include hedonic motivation, defined as the enjoyment or pleasure derived from the use of a technology; price value, defined as the cognitive trade-off between consumers' perceived benefits of applications and the monetary cost of using them; and habituation, defined as a perceptual construct reflecting the results of previous experiences (Ventakesh et al., 2012).

It is seen that the most important antecedent of behavior in all the models mentioned is intention. Many studies have been conducted to measure online purchase intention (e.g., Lim, et.al., 2016; Yılmaz, 2016) and behavior (e.g., Çelik & Taş, 2021) directly and indirectly through attitudes (e.g., Akroush & Al-Debei, 2015; Chetioui et.al., 2021). In these studies, it has been found that online purchase intention and positive attitudes towards online purchasing positively predict online purchasing behavior. Based on these findings, the first hypothesis of the study is given below.

H1: Online purchase intention positively predicts online purchase behavior.

In understanding online shopping behavior, it is important to consider inhibitory and driver factors because they play an important role in shaping consumers' behavior (Ha et al., 2019). Events that change social practices, such as the pandemic, have also led elderly individuals to change and adapt their shopping methods. Restrictions such as curfews have become one of the factors driving the increase in online shopping (Fuentes et al., 2022). In other words, the limitations imposed by the pandemic can be considered a factor that increased the intention to online shopping and, indirectly, the behavior itself. However, during this process, the support of relatives may lead to the partial or complete assumption of this responsibility by another person rather than

the development of autonomous behavior. In assisted shopping, which is defined as shopping involving close friends and relatives, product orders are delegated to others acting as mediators (Hansson et al., 2022). In this case, close support may become an inhibitor of autonomous online shopping behavior rather than support for using an online platform.

The literature shows that consumers' behavioral intentions lead to actual use of online shopping platforms (Ching et al., 2021). In all of the aforementioned models, in addition to intention as antecedents of behavior, many driving and inhibiting factors are included together. However, in some contextual conditions, factors that are expressed as driving forces (such as the number of household members) may also appear as inhibiting factors. One of the important reasons for this is social norms. Social norms affect behavior and thus consumer behavior (Melnyk, et. al., 2021). In structures such as Türkiye, where the responsibility of caring for elderly parents belongs to children and relatives, the caregiving obligation sometimes even restricts the caregivers' own lives (Doğanay & Güven, 2019). Since the needs of the elderly are met by their relatives, they do not have to be active, including their daily chores. While this may seem unchangeable and uncomfortable for seniors, a study conducted in Türkiye found that older adults who have children receive more and more help from their children as they get older, and that this help contributes positively to their overall well-being (Inel et al., 2021). There is also a tendency towards extended family models where it is generally accepted to live with their children as next-door neighbors (Imamoğlu, 2015), which does not allow the senior adult to be independent/autonomous. This situation is an example of how the presence of relatives prevents the active participation of 65+ individuals in life. However, in the UTAUT model, the facilitating effects of the environment are included. The other hypotheses of the study, which are based on the social norms in Türkiye and the sense of commitment of people who undertake the task of caring for senior adults, are given below.

H2: Assisted shopping negatively predicts online purchase behavior.

H3: Assisted shopping has a moderating role between online purchase intention and behavior.

3. Method

3.1. Research Model

In this study, correlational survey method, one of the quantitative research methods, was used. Correlational research designs allow for the examination of natural associations between variables without establishing causal relationships (Creswell and Creswell, 2017). This method is important because it allows data to be collected from a large group of participants in a short period of time and at a lower cost (Büyüköztürk et al., 2017). The model tested in the research is given below.

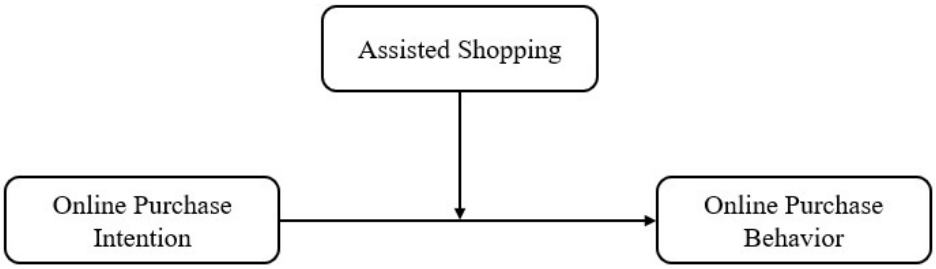

Figure 1. Research Model

3.2. Population and Sample

The population of the study consists of 65+ senior adults living in Türkiye. Data collection processes within the scope of the study were carried out following the ethical approval of Bolu Abant İzzet Baysal University Human Research Ethics Committee in Social Sciences with the decision number 2019/08 dated 10.08.2019. Stratified sampling method was used to reach 635 participants (262 women, 373 men) aged 65+ from 14 provinces of Türkiye (two provinces were randomly selected from each of the seven regions). The selected provinces, the elderly population in these provinces, and the number of data collected from each province are presented in Table 1.

Table 1. Distribution of the Sample by Region and Province

Regions	Randomly Selected Provinces	65+ Population	Number of Surveys Reached
Mediterranean	Adana	167 347	69
	Antalya	186 805	77
Central Anatolia	Karaman	28 591	14
	Eskişehir	93 452	40

Blacksea	Zonguldak	68 339	28
	Kastamonu	62 719	26
Southeastern Anatolia	Gaziantep	104 087	43
	Mardin	42 687	22
Marmara	Edirne	55 094	23
	Kocaeli	128 625	53
Eastern Anatolia	Erzurum	62 382	26
	Kars	22 267	11
Aegean	İzmir	450 925	186
	Uşak	41 437	17
	TOTAL	**1.514.757**	**635**

When the distribution of the participants according to their educational status was examined, it was seen that 17.6% had primary school (N=101), 11.5% had secondary school (N=66), 31.2% had high school (N=179), 9.1% had associate's degree (N=52), 26.1% had bachelor's degree (N=150) and 4.5% had postgraduate degree (N=26). While 95.1% of the participants have children (N=604), 4.6% do not have children (N=29). 31.3% of the participants stated that they shop online themselves (N=199) and 52.4% of them shop online through their relatives (N=333).

Table 2. Sample Demographic Information

Variable	Category	% - N (635)
Age	65-74	82.8 – 526
	75-84	16.1 – 102
	85+	1.1 – 7
Sex	Female	41.3 – 262
	Male	58.7 – 373
Education	Primary School	17.6 – 101
	Secondary School	11.5 – 66
	High School	31.2 – 179
	Associate Degree	9.1 – 52
	Undergraduate	26.1 – 150
	Graduate	4.5 – 26
Having a child	Yes	95.4 – 604
	No	4.6 – 29
Buying online in person	Yes	31.4 – 199
	No	68.6 – 435
Buying online through relatives	Yes	52.4 – 333
	No	47.6 – 302

3.3. Data Collection Tools

Within the scope of the study, data were collected from the participants by face-to-face survey method. Demographic information forms were used to collect data from participants on their age, gender, educational status, province of residence, whether they had children, and whether they shopped online themselves or through their relatives. 4-item 5-point Likert (1-Totally Disagree; 5-Totally Agree) Online Purchase Intention Scale (Çelik, 2009) used for participants' intentions to purchase online (sample item, I will purchase online as soon as possible). Chan's (2001) behavioral measurements consisting of three questions (1- How often do you shop on the Inter-

net?, 2- How much do you spend on your online purchases?, 3-How much do you buy products on the Internet?) were used for online purchasing behavior. The items were translated into Turkish by researchers and checked for clarity. In a preliminary study conducted with a sample of 415 participants, it was found that three items explained 73.77% of the variance, with item factor loadings ranging from .718 to .933. The Cronbach alpha reliability coefficient was calculated as .794. Child/relative support was measured through the Assisted Shopping subscale (sample item, "Since children meet all their needs, there is no need to shop online") of the Online Purchase Barriers Scale (Nurtanış Velioğlu et al., 2022). This subscale is a subdimension of the online shopping barriers scale and includes attitudes that older individuals do not need to shop because their relatives carry out the online shopping process for themselves. Within the scope of the study, the internal consistency coefficients for the measurement tools were found to be .937 for Online Purchase Intention, .898 for Online Purchasing Behavior, and .845 for Child/Relative support.

4. Findings

Within the scope of the study, normality assumptions were tested for the variables and it was seen that kurtosis skewness values were within ±1 (Table 3) and Z scores were within ±3.29.

Table 3. Descriptive Statistics of Variables

	$\bar{X}$	sd	Kur.	Skew.	Cron. α
Assisted shopping	3.08	1.10	-.032	-.888	.845
Online purchase intention	2.82	1.12	-.057	-.876	.937
Online purchase behavior	1.93	.92	.547	-.782	.898

First of all, Pearson Correlation analysis was conducted to examine the relationships between the variables. According to the results of the analysis, there was a significant positive relationship between online purchase intention and behavior (r= .631, p<.01). Assisted shopping was found to be negatively correlated with both online purchase intention (r= -.298, p<.01) and online purchase behavior (r= -.259, p<.01).

Tablo 4. Pearson Correlation Analysis Findings for the Relationships between Variables

	$\bar{X}$	sd	1	2	3
1. Assisted shopping	3.08	1.10	–		
2. Online purchase intention	2.82	1.12	-.298**	–	
3. Online purchase behavior	1.93	0.92	-.259**	.631**	–

**p<.01

The moderating role of assisted shopping in the relationship between online purchase intention and behavior was tested with the Process Macro extension (Model-1) developed by Hayes (2013). The results of the analysis showed that the model obtained for the moderating effect was significant (R2=.414; F(3-631)=148.28; p<.01) and that assisted shopping had a moderating role in the relationship between intention and behavior (β=-0.070; p<.01). The prediction of online purchase intention on behavior is more significant when assisted shopping is high (β=.412; p<.01) than when it is medium (β=.482; p<.01) and low (β=.569; p<.01). Conditional effect analysis revealed that the effect of intention on behavior remained statistically significant all observed values of assisted shopping. Specifically, at low levels of assisted shopping, the effect of intention on behavior was stronger (β=.569, SE = .03, t = 16.83, p < .001, 95% CI [.50, .64]). At average levels of assisted shopping, the effect remained significant but weaker (β=.482, SE = .03, t = 17.87, p < .001, 95% CI [.43, .53]). At high levels of assisted shopping, the effect of intention on behavior was further reduced yet still significant (β=.412, SE = .04, t = 10.82, p < .001, 95% CI [.34, .49]). Johnson–Neyman analysis indicated that there were no transition points within the observed range of the moderator, suggesting that the effect of intention on behavior was consistently significant across all levels of assisted shopping. Figure 2 and Table 5 provide detailed information on the interaction effect of online purchase intention and assisted shopping.

Table 5. The Moderating Role of Assisted Shopping on the Relationship between Online Purchase Intention and Behavior

Variables	ß	SE	t	p	%95 CI	
					LLCI.	ULCI.
Constant	.116	.230	.504	.614	-.336	.568
Online purchase intention	.708	.070	10.150	.000	.571	.845
Assisted shopping	.131	.067	1.955	.051	-.001	.262
Online purchase int. X Ass. shop.	-.070	.022	-3.205	.001	-.112	-.027
Model Summary	R	R2	F	p	Δ R2	Δ F
	.643	.414	148.281	.000	.010	10.273

Dependent variable: Online purchase behavior

Note: The figure shows the interaction of online purchase intention and assisted shopping (close support). The blue line represents the low close support (16th percentile); the purple line represents the average close support (50th percentile); and the red line represents the high close support (84th percentile).

Figure 2. The Interaction of Assisted Shopping and Online Purchase Intention

5. Discussion

Increased familiarity with digital technology, coupled with the constraints of social isolation resulting from events such as the COVID-19 pandemic, has also had various impacts on the purchasing processes of the elderly. In Türkiye, there are limited studies on the facilitating and inhibiting factors affecting online purchasing decisions in the elderly consumer market, where internet use is rapidly expanding. Since the difference in cultural structure will cause some differences in decision-making processes, studies focusing on the social structure of Türkiye are very important.

Although it is a positive situation that the elderly are supported by their wide and/or narrow social circles, relatives, etc., and that their work is seen by their relatives on their behalf, it is among the inhibitors of online shopping on the basis of this study. Şah and Eroğlu (2022) state that individuals cannot be considered separately from the society they live in, and that the cultural environment affects individuals' value judgments, norms, behavior patterns, roles, language use, and thus their ways of thinking. Naturally, the elderly, like all members of society, cannot be considered separately from the cultural environment in which they live. In Türkiye, there is a functional and psychological tendency to live in extended families and care for the elderly is seen as an obligation of close family and kinship relations (Imamoğlu & Imamoğlu, 1996). In traditional family structures, children are more interested in their parents and often buy things that parents need on their behalf (Wang & Jiang, 2021). According to Pantano et al. (2022), older consumers see family members as the first point of contact for help with technology, rely on their families, and as a result, the autonomy of individual shopping is severely limited. The fact that extended family relations are intense in Türkiye is thought to support the sharing of daily responsibilities and the automatic removal of individual workloads from them as well as affecting the social relations of the elderly. These results are consistent with the findings that cultural differences have an impact on online purchasing behaviors (Smith, et. al, 2013) and that social influence has less online purchasing impact in Türkiye compared to other cultures (Gurcan, 2017).

When family support decreases, the impulse to buy online may intensify, suggesting a compensatory mechanism that suggests that these individuals may rely more on their individual decision-making processes in the absence of external incentives. Indeed, perceived behavioral control in the Theory of Planned Behavior (Ajzen, 1991) is related to having more control over one's behavior. Therefore, contrary to popular belief, external support may become an inhibitor of online purchasing behavior by interfering with the control over behavior and the hedonic pleasure emphasized in the UTAUT model (Venkatesh et al., 2003).

This study has shown that child/relative support may be an inhibiting factor in the relationship between online purchase intentions and behaviors of 65+ senior adults. In this respect, it differs from other studies in the literature that suggest that support may be a facilitating factor. This differentiation may be explained by the fact that in collectivist structures, the duty of caring for the elderly is imposed on family members. In collectivist structures such as Türkiye's social dynamics, it can be said that some behaviors that are seen as for the benefit of family elders/senior adults limit their adaptation in terms of experiencing new innovations, new technologies, new consumption processes, and limit their potential to try new behaviors and improve themselves because they do not feel obliged. Increased support may facilitate a smoother transition to online shopping, while decreased support may paradoxically push older adults to be more decisive in their purchase intentions. Support from relatives can sometimes be "doing on behalf of" rather than "leading," which can unintentionally limit older people's exposure to online purchasing. This ambivalence underlines the complexity of online shopping behaviors among older adults and calls for further research to examine these relationships in depth.

Self-determination theory, which focuses on the effects of social environment on attitudes, values, behaviors and motivation, argues that being development-oriented and having a motivation for self-improvement are inherent characteristics of human nature (Deci & Ryan, 2012). Although the theory suggests that individuals can fulfill this basic need if the environment supports autonomy, there are studies showing that relatedness is a more important need than autonomy in Eastern cultures (Markus et.al., 1996). When it comes to 65+ senior adults adapting to change, their intrinsic motivation to experience autonomy and success may be replaced by a desire to share this process with others with whom they are related. This relatedness therefore has the potential to be a barrier to autonomy and development. When support undermines a sense of autonomy, it can prevent online purchase intentions from turning into behavior.

From a practical perspective, these findings suggest that interventions should target not only older adults but also their family members. Awareness programs can help family members transition from a caregiver role to a supporter role, thereby promoting autonomy rather than dependence. E-commerce platforms can support this process by designing age-appropriate user interfaces and offering interactive training courses that encourage independent use. Similarly, community-based digital literacy initiatives can give older adults the confidence and skills they need to shop online without relying excessively on family members. By reducing the unintended inhibiting effects of close support, these measures can increase older adults' participation in the digital marketplace and promote broader acceptance of technologies.

This study is considered to be an important contribution to the literature in Türkiye in terms of addressing close support as one of the inhibitors of online purchasing behaviors and addressing the complex relationship between support and behavior. Future studies can offer a more in-depth perspective on the purchasing decisions of 65+ individuals by examining the cognitive characteristics, household size and support received from their close environment together. In addition, it is very important to seek an answer to the question of whether senior adults receive support because they do not trust in the process of adapting to new technologies or whether they do not trust because they receive support and cannot be autonomous. In this study, the majority of participants were between the ages of 65 and 74, while the number of participants aged 75 and older was limited. This situation limits the generalizability of the findings, particularly to the older age group (75+). In future research, working with samples that more evenly represent older adults will increase the validity of findings related to online purchasing behavior across a wider age range.

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