

## Evaluating the Effect of Students' Artificial Intelligence Anxiety on Their Attitudes Towards Technology

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### Abstract

AI anxiety, which is used to refer to fear and anxiety about out-of-control AI, is of interest to researchers. This study aims to understand students' AI anxiety and attitudes towards technology and to investigate how attitudes towards AI affect attitudes towards technology. This study was conducted using a survey model within the scope of quantitative research methods. The sample of the study consists of 2.035 people. In the study, questionnaire was used as the data collection tool; validity and reliability analyses for the scale, normality analysis, t-tests, and ANOVA tests were performed. The study resulted in the following conclusion: it was determined that gender, age and the duration of using information techno-

logies have statistical effects on students' AI anxiety and attitudes towards technology. Accordingly, it was revealed that women have higher AI anxiety than men, while their attitudes towards technology are lower. It was also understood that as the duration of using information technologies increases, participants' attitudes towards technology improve while their AI anxiety decreases.

**Keywords:** Technology, Attitude, Artificial Intelligence (AI), Artificial Intelligence Anxiety (AIA), Technology Education.

**JEL Codes:** D83, O33, I21

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## 1. Introduction

The rapid advancement of artificial intelligence (AI) has propelled it from the domain of science fiction into the realm of everyday life. Technologies such as self-driving vehicles, intelligent recommendation systems, image recognition software, and virtual assistants demonstrate the growing presence of AI in many areas of society. These developments have significantly increased public and academic interest in AI and its potential implications for the future. As AI systems become more integrated into social, economic, and technological structures, understanding the human and psychological dimensions of these technologies has become increasingly important. In particular, the use of AI in areas such as online communication, medical diagnostics, and predictive decision-making systems has raised significant ethical and societal concerns regarding trust, bias, transparency, and value alignment (Bonneton et al., 2024).

Alongside the benefits of AI technologies, public debates increasingly focus on potential risks and uncertainties related to their development and use. Questions such as "Are we safe in a future shaped by AI?" have stimulated both academic discussions and public concerns. These concerns have led researchers to examine psychological responses to AI technologies, particularly those related to fear, uncertainty, and perceived risks (Köse, 2018). As AI systems become more visible in daily life, individuals' perceptions of these technologies may influence how they interact with and evaluate them.

One of the most widely discussed psychological responses to AI is AI anxiety, which refers to the feelings of fear, apprehension, or discomfort individuals experience when interacting with or thinking about AI technologies (Çiçek & Çoban, 2024: 1184). AI anxiety can emerge from various concerns, including fears of job displacement, loss of human control over intelligent systems, and the broader societal consequences of automation (Uçar et al., 2024). In recent years, concerns about automation replacing human labor have become one of the most prominent sources of anxiety related to AI. At the same time, some scholars argue that a substantial portion of AI-related anxiety stems from misunderstandings and misinformation about the capabilities and limitations of AI technologies (Johnson & Verdicchio, 2017: 2268). Therefore, examining individuals' perceptions and attitudes toward AI has become an important area of research.

Within educational research, students' attitudes toward technology (ATT) have long been considered a critical factor influencing learning outcomes, career choices, and technological literacy. For more than three decades, researchers have investigated students' attitudes toward technology in order to better understand their engagement with technological subjects and the effectiveness of technology

education programs (Ankiewicz, 2019: 38). Attitudes toward technology are particularly important because they can influence students' willingness to learn about technological innovations and to develop competencies related to emerging technologies (Yurdagül & Aşkar, 2008: 294).

In the context of the Fourth Industrial Revolution, technological literacy has become an essential competence for individuals in modern societies. Rapid technological developments require individuals not only to understand technology but also to adapt to technological change and its implications for everyday life and future careers (Korhonen et al., 2022). Research suggests that individuals' knowledge and experiences with technology significantly influence their attitudes toward it (Ardies et al., 2013: 9). Students who develop a positive attitude towards technology are more likely to take an interest in technological subjects and develop technological literacy. This can be defined as the ability to use, manage, evaluate and understand technological systems (Boser et al., 1998: 6).

However, previous research also indicates that although students often display generally positive attitudes toward technology, their conceptual understanding of technology may remain limited. Many students tend to perceive technology primarily as a collection of tools, products, or artifacts rather than as a broader process involving innovation, design, and problem-solving. In addition, several factors may influence students' attitudes toward technology, including gender, family background, and exposure to technological environments (Ankiewicz, 2016: 10). Understanding these factors is therefore important for improving technology education and supporting students' engagement with emerging technologies.

Despite the growing body of research on both AI anxiety and attitudes toward technology, the relationship between these two constructs has received limited attention in the literature. In particular, few studies have examined how concerns about AI may influence students' broader attitudes toward technology. As AI technologies become increasingly visible in educational, professional, and social contexts, understanding this relationship becomes essential. Investigating whether students' anxiety about AI affects their attitudes toward technology can provide valuable insights for technology education, curriculum development, and the promotion of technological literacy.

### Purpose of the Research

Given this gap in the literature, the present study aims to examine the relationship between university students' AI anxiety and their attitudes toward technology. Specifically, the study investigates whether AI anxiety influences different dimensions of students' attitudes toward technology, including ten-

gency toward technology, negativeness of technology, importance of technology, and technology for all, as measured by the PATT framework.

In addition, the study explores whether gender differences exist in both AI anxiety and attitudes toward technology. By addressing these issues, the study aims to contribute to the growing literature on AI perceptions and technology attitudes and to provide insights into how emerging AI-related concerns may shape students' engagement with technology. Accordingly, the research questions of the study are as follows:

1. Do students' AI anxiety levels affect their attitudes toward technology?
2. Do male and female students have different attitudes towards technology?
3. Do male and female students experience different levels of AI anxiety?

## 2. Literature Review

### 2.1. AI Anxiety

"AI anxiety", used to refer to the fear and anxiety expressed about out-of-control AI, is defined as panic and nervousness due to the unknown aspects of AI development. Anxiety surrounding artificial intelligence often stems from a focus on the programs themselves, rather than the people and human behaviours that create, deploy, maintain and give meaning to their operations. This raises concerns about the human users and designers of artificial intelligence. Another cause for concern is the idea that AI may have been developed to serve the interests of a select few (Johnson & Verdicchio, 2017: 2268-2270).

A study was conducted with nursing students to understand their perceptions of advanced technology and artificial intelligence in clinical care and education. The following were found: The study revealed that the students had a positive view of the technology, believing it would improve patient care and efficiency and reduce human error. However, they also expressed concerns about job losses, a lack of human interaction, and ethical and legal issues (Abdelaziz et al., 2025). Despite the advantages of AI, there are concerns that this technology will replace human labour. Students remain concerned about ethical education in AI and aspects of human-AI collaboration (Amiri et al., 2024). A study investigating the attitudes and concerns of healthcare professionals towards AI applications in medicine found that 80% of participants believed there could be serious privacy issues associated with AI use, while 40% thought AI was potentially more dangerous than nuclear weapons. While 79% believed that AI could be beneficial in their field, only 10% were concerned that it would replace them at work. Many healthcare professionals do not fully understand the princi-

les of AI, which is why they are concerned about its potential impact on clinical practice if it becomes widely used (Castagno & Khalifa, 2020). While AI is an algorithm that mimics human intelligence to function, it carries concerns about unintended ethical issues that can increase discrimination and injustice, loss of privacy, control, etc. (Ajonbadi et al., 2024). The main sources of artificial intelligence anxiety are inequality, ethics, privacy, and reliability, professional and social anxiety, unpredictable decisions and loss of control, technology use and adaptation difficulties, artificial intelligence addiction, and decreased creativity (Agca & Korkmaz, 2025).

In the studies conducted on AIA levels in the literature, it was found that nursing students had an intermediate attitude towards AI (Lukić et al., 2023; Ongün et al., 2024; Menekli & Şentürk, 2022); medical students had high levels (Özbek Güven et al., 2024); future nurses had high levels of knowledge, attitudes and anxiety about AI applications (Yiğit & Açıkgoz, 2024); surgical nurses were above average (Alkan, 2025: 11); and health professionals had moderate levels (Filiz et al., 2022: 47). Similarly, teacher candidates' anxiety levels about AI were measured at medium level (Ayduğ & Altınpulluk, 2023); university students' anxiety levels were measured at medium level (Ulukapı Yılmaz & Yılmaz, 2024: 184; Uçar et al., 2024) and low level (Gültekin et al., 2022: 477). It was observed that nurses and nurse candidates had medium-level anxiety about humanoid nurse robots and AI health technologies in patient care (Maraş et al., 2024); the anxiety levels of tourism workers regarding AI were at a low level (Çetiner & Çetinkaya, 2024: 160). It has been observed that service sector employees' future concerns about AI are at a moderate level (Belber & Özmen, 2024). It was measured that nurses who are managers have lower AI anxiety levels, while other employees have higher levels, and those whose working style is shift work have lower AI anxiety levels compared to other employees (Gümüş & Uysal Kasap, 2022).

Looking at the studies on AI concerns in the literature, a low level relationship was found between AI concerns of accounting profession candidates and their career decisions (Köse, 2025: 578). A high negative correlation was found between AIA and spiritual care perceptions of internal medicine nurses (Menekli & Şentürk, 2022). A negative relationship was found between AIA levels and self-efficacy levels of nursing students (Varol, 2025). It has been observed that AIA has a negative effect on job engagement in academicians (Çiçek & Çoban, 2024: 1184). It was found that there was a negative relationship between job performance of surgical nurses and AIA (Alkan, 2025: 11). The relevant advantage of AI and the perceived ease of use of AI were found to have a positive and significant effect on the adoption of blockchain technology (Polas et al., 2022). It has been observed that the positive attitude of me-

dical, dental and nursing students towards AI facilitates the acceptance of AI technology (Amiri et al., 2024). A positive and significant low-level relationship was found between AIA and intrinsic motivation of tourism employees (Çetiner & Çetinkaya, 2024: 160). A moderate positive relationship was found between AIA and unemployment anxiety among university students (Uçar et al., 2024). It was observed that students were concerned that they would lose their jobs due to AI and that they would not be able to find a new job (Gültekin et al., 2022). In undergraduate audiology students, it was observed that as the awareness and usage sub-dimensions of AI literacy increased, AIA decreased (Kuntman & Polat, 2025). In South Korea, the perception of AI was positively correlated with the intention to use AI and the acceptance attitude towards AI, and negatively correlated with anxiety. However, anxiety about AI was negatively correlated with both acceptance and intention (Cho & Seo, 2024).

It can be seen that medical students are more accepting of AI than fearful of technology. Furthermore, a strong positive correlation was found between AI literacy and positive attitudes towards AI, and a weak negative correlation was found between AI literacy and negative attitudes. These results clearly show a correlation between AI literacy and attitudes towards AI (Laupichler et al., 2024). It was found that AIA of university students negatively affected career determination (readiness for career choice). It was observed that learning, job change and sociotechnical blindness sub-dimensions of AIA significantly negatively affected career determination (Gültekin et al., 2022: 477). It was determined that students with negative feelings about AI had higher levels of AIA (Yiğit & Açıkgöz, 2024). It was found that positive general attitudes towards AI increased with higher levels of computer usage and knowledge about AI, while AI learning anxiety had the opposite effect (Kaya et al., 2024).

As AI technologies such as facial recognition and autonomous driving become more widespread in the future, new concerns and security issues are expected to arise. Consequently, as technology progresses, there will be a corresponding increase in the prevalence of anxiety about AI among the general public. In light of the pervasive integration of AI into our daily lives and the associated potential repercussions, it is imperative to acknowledge the societal challenges that arise from this technological advancement, in addition to the technical intricacies inherent to the field (Li & Huang, 2020: 2). In many studies conducted in the literature and mentioned above, it has been reported that individuals have anxiety about AI. Evaluating students' views on AI is of great importance in terms of determining their anxiety levels about this subject and affecting their attitudes towards science and technology in the future.

## 2.2. Attitude Towards Technology

The digitalization of society and the continuous development of technology make it imperative to provide students with adequate technology education at all levels and, accordingly, to investigate students' ATT. In the contemporary digital era, it is imperative not only to instruct students in the utilisation of technology, but also to cultivate technological literacy, a skill that is indispensable in societies that are increasingly dependent on technology. Technological literacy is defined as the set of skills required to utilise, comprehend, generate and evaluate technologies in a critical manner (Korkeaniemi et al., 2025). ATT is defined as the degree of positive or negative evaluation an individual has of a particular technology. It is an important factor influencing behavioural intention in technology adoption frameworks. The concept under scrutiny herein integrates cognitive appraisals of technology, including its perceived usefulness and user-friendliness, with the propensity to accept or utilise it. Given that perceptions and emotions around technology greatly influence its acceptance, attitude is a significant factor in understanding how professionals interact with emerging technologies such as artificial intelligence (Emon & Khan, 2025: 4).

Technology, defined as any change made to the natural world to meet human needs or wants, is becoming an increasingly popular subject in the school curricula of western countries (Ardies et al., 2013: 8). It has been emphasized that both students' and schools' ATT can play an important role in addressing the expected shortage of technology in the labor market (Ardies et al., 2014). Forming a good concept of technology in students' minds is one of the goals of technology education (de Vries, 2005: 149). Understanding students' technological literacy and ATT is a prerequisite for effective teaching about technology (Ardies et al., 2013: 9). The lack of research focusing on students' ATT has been pointed out. In order to understand students' ATT, detailed research on how and when these attitudes are formed is needed (Ardies et al., 2015). It has been suggested that students' negative or positive ATT will play an important role in guiding and predicting future actions in society (Volk & Yip, 1999).

According to the traditional approach, an attitude towards a concept such as technology comprises two components: the cognitive component, which is made up of beliefs relating to this concept; and the affective component, which is made up of emotional reactions relating to this concept (Ankiewicz, 2016: 3). These responses result in decisions to engage in behaviour, which includes a person's predisposition or readiness to act, as well as their actions related to the 'behavioural object' (Ankiewicz, 2019: 39).

### 2.3. Research Hypotheses

In the studies conducted on AIA in the literature, it is seen that employees' anxiety generally stems from not being able to fully learn technological innovations and that AIA is a security vulnerability (Belber & Özmen, 2024); there are concerns, fears and uneasiness that AI may get out of control about the future development and may affect people and society in disastrous ways (Johnson & Verdicchio, 2017); the idea that people will lose their jobs because of artificially intelligent robots is one of the biggest concerns about AI technology in recent times (Uçar et al., 2024); regarding the attitudes and concerns towards AI applications in medicine, the participants believe that there may be serious privacy problems associated with the use of AI, they think that AI is potentially more dangerous than nuclear weapons and they are worried that AI will replace them in their jobs (Castagno & Khalifa, 2020); students are worried that they will lose their jobs and will not be able to find a new job because of AI (Gültekin et al., 2022); despite the advantages of AI, there is a fear that this technology will replace human labor (Amiri et al., 2024); students have concerns about ethical education in AI and aspects of human-AI collaboration (Amiri et al., 2024); that AI, although an algorithm that imitates human intelligence to function, may cause undesirable ethical issues that may increase discrimination and injustice, loss of privacy, control, etc. (Ajonbadi et al., 2024); and that the use of online bots, AI-assisted medical diagnoses and predictive algorithms raises important moral questions about trust, bias and value alignment (Bonneton et al., 2024: 654).

In addition, it has been found that students who have negative feelings about AI have higher levels of AI anxiety (Yiğit & Açıkgöz, 2024); anxiety about AI is negatively related to acceptance attitudes towards AI and intention to use AI (Cho & Seo, 2024); there is a positive relationship between AI anxiety and unemployment anxiety (Uçar et al., 2024); there is a positive relationship between AI literacy and positive attitudes towards AI, and a negative relationship between AI literacy and negative attitudes (Laupichler et al., 2024); there is a relationship between AI anxiety and career decisions (Köse, 2025: 578); there is a negative relationship between AI anxiety of students and general self-efficacy (Varol, 2025); there is a negative relationship between AI anxiety of surgical nurses and job performance (Alkan, 2025: 11); AI anxiety has a negative and significant effect on job commitment (Çiçek & Çoban, 2024: 1184); AI anxiety of university students negatively affects career determination (readiness for career choice) (Gültekin et al., 2022: 477); It was found that there was a high negative correlation between internal medicine nurses' AI concerns and their perception of spiritual care (Menekli & Şentürk, 2022).

In the study examining the relationship between ATT and intention to use AI, it was found that ATT had a significant positive effect on intention to use AI (Emon & Khan, 2025: 7) and that computer usage level and knowledge level about AI increased positive general attitudes towards AI, while anxiety about learning AI decreased positive general attitudes towards AI (Kaya et al., 2024). A person's level of knowledge about a technological subject can be related to their attitude towards that subject (Ardies et al., 2013: 9). The strength of an attitude is defined by its influence on thought and action in different situations. Some attitudes are strong and some are weak. Strong attitudes are those that are most important to an individual's thoughts, intentions, and behaviours. This results in attitudes having a greater influence on behavioural intentions and actions. Therefore, important attitudes are real and consequential psychological forces, and studying them provides opportunities to address behavioural change (Howe & Krosnick, 2017: 328). It can be argued that students' having a positive attitude will facilitate their acceptance of AI technology (Amiri et al., 2024), while having a negative attitude will make it difficult to accept these technologies. Based on these studies analyzed in the literature, the following hypothesis was formed based on the fact that people's attitudes towards AI may affect their tendencies towards technology.

H1: There is a negative correlation between AI anxiety and the tendency to use technology.

H2: There is a positive correlation between AI anxiety and the negativeness of technology.

H3: There is a negative correlation between AI anxiety and the contribution and importance of technology.

H4: There is a negative correlation between AI anxiety and technology for all.

It has been suggested that gender factor is an important variable in studies on anxiety about AI, acceptance attitude towards AI and intention to use AI with different professional groups in various sectors in many fields (Ayduğ & Altınpulluk, 2023; Uçar et al., 2024; Cho & Seo, 2024; Çetiner & Çetinkaya, 2024: 160; Köse, 2025: 578; Alkan, 2025: 11; Ongün et al., 2024; Lukić et al., 2023; Pinto dos Santos et al., 2019; Laupichler et al., 2024; Ulukapı Yılmaz & Yılmaz, 2024: 185; Kaya et al., 2024; Filiz et al., 2022: 47; Gümüş & Uysal Kasap, 2022; Başer et al., 2021). Based on these studies, the following hypothesis was formed.

H5: AI anxiety differs according to gender.

The term technological gender gap refers to the idea that men and women have different attitudes, behaviors and skills related to technology. Many studies have investigated the existence of a gen-

der gap that, if ignored, could leave many female students unprepared to deal with the technological challenges of the future. For educators and computer-based instructional designers interested in providing equal educational opportunities for male and female students, the quest to improve the technological gender gap is ongoing (Canada & Brusca, 1991). Significant differences in technology perspectives between boys and girls have been found on a number of items. The interest that students have in technology, their attitudes towards its inclusion in the school curriculum and their opinions on technology-related careers suggest that there may be significant differences between girls and boys (Volk & Yip, 1999; Raat & de Vries, 1985; Weinburgh, 1995: 387; Ian Robertson et al., 1995: 73; Colley et al., 1994: 129; Elvstrand et al., 2012; Bozdemir et al., 2021: 40; Boser et al., 1998: 12; Kılınç et al., 2016; Francis, 1993; Bame, 1993). Based on these differences, the following hypothesis was formed.

H6: ATT differ according to gender.

### 3. Methodology

Survey model, one of the quantitative research designs, was preferred in the study. Questionnaire method was used to collect the data. The data obtained were analyzed using SPSS 24 and Smart PLS.

#### 3.1. Population of The Study and Sampling Procedure

Data for the study was collected using the survey method. The sample of the study consists of 2,035 randomly selected university students in Osmaniye. The data for this study were collected between 22 May and 22 June 2025. Approval from the ethics committee at Osmaniye Korkut Ata University was received (dated 21.05.2025 and numbered E.234799).

#### 3.2. Measurement

The questionnaire used for data collection consists of three parts. The scales used, except for demog-

raphic and control variables, are in five-point Likert type. The first section includes demographic information such as age and gender of the participants and control variables such as hours used, tools owned, and purpose of use.

The second part includes the "AIA scale" developed by Wang & Wang (2022) and validated and reliably validated in Turkish by Terzi (2020), consisting of 21 statements and four dimensions (learning, job change, sociotechnical blindness and artificial intelligence configuration). The Cronbach's Alpha reliability coefficient was 0.96 for the complete scale (21 items), which belongs to the adaptation study. Sample statements in the scale are as follows: Learning to use artificial intelligence products makes me anxious. I worry that an AI product might replace humans. I worry that an AI product might be misused. I find humanoid AI products scary. The same scale has been used in different studies to measure anxiety levels related to artificial intelligence (Ulukapı Yılmaz & Yılmaz, 2024; Alkan, 2025; Ayduğ & Altınpulluk, 2023; Başer et al., 2021; Kaya et al., 2024).

In the third section, the scale of students' ATT, which was translated into English by Bame & Dugger (1989) and consisted of 58 statements and 6 dimensions (interest, gender, importance, difficulty, education, career), was adapted into Turkish by Yurdagül & Aşkar (2008: 306), and the scale was transformed into a new version with 4 dimensions and 24 statements. The dimensions of the scale are tendency towards technology (8 statements) dimension (I will probably choose a job in the field of technology.); negativity of technology (7 statements) dimension (Technology causes massive unemployment.); contribution and importance of technology (6 statements) dimension (Technology is good for the future of our country.) technology for everyone (3 statements) dimension (Everyone can study in the field of technology.). The Cronbach's Alpha reliability coefficient was 0.93 for the complete scale (24 items, 4 sub-constructs), which belongs to the adaptation study. The same scale has been used in different studies to measure students attitudes toward technology (Boser et al., 1998; Bozdemir et al., 2021).

## 4. Results

Table 1. Demographic Profile of the Respondents (N=2035)

| Variable | N (%)         | Attitude towards technology |      |       | AI anxiety |      |       |
|----------|---------------|-----------------------------|------|-------|------------|------|-------|
|          |               | M                           | SD   | t (p) | M          | SD   | t (p) |
| Gender   |               |                             |      |       |            |      |       |
| Male     | 740 (36,36)   | 3,21                        | 0,67 | 0,000 | 2,71       | 0,96 | 0,000 |
| Female   | 1295 (%63,64) | 3,08                        | 0,59 |       | 3,10       | 0,91 |       |

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Table 2. Technology Tool Ownership (N=2035)

| Owned IT tools          |               |      |      |       |      |      |       |
|-------------------------|---------------|------|------|-------|------|------|-------|
| <b>Smartphone</b>       |               |      |      |       |      |      |       |
| No                      | 59 (%2,90)    | 3,23 | 0,64 | 0,192 | 3,03 | 0,90 | 0,541 |
| Yes                     | 1976 (%97,10) | 3,12 | 0,62 |       | 2,96 | 0,95 |       |
| <b>Tablet</b>           |               |      |      |       |      |      |       |
| No                      | 1507 (%74,05) | 3,12 | 0,62 | 0,253 | 2,97 | 0,94 | 0,397 |
| Yes                     | 528 (%25,95)  | 3,15 | 0,63 |       | 2,93 | 0,97 |       |
| <b>Laptop</b>           |               |      |      |       |      |      |       |
| No                      | 892 (%43,83)  | 3,05 | 0,63 | 0,00  | 3,06 | 0,92 | 0,00  |
| Yes                     | 1143 (%56,17) | 3,19 | 0,61 |       | 2,88 | 0,96 |       |
| <b>Desktop computer</b> |               |      |      |       |      |      |       |
| No                      | 1702 (%83,64) | 3,11 | 0,62 | 0,007 | 2,97 | 0,93 | 0,122 |
| Yes                     | 333 (%16,36)  | 3,21 | 0,64 |       | 2,89 | 1,03 |       |

Table 2. Technology Tool Ownership (N=2035)

| For what purposes do you use information technologies most frequently? |               |      |      |       |      |      |       |
|------------------------------------------------------------------------|---------------|------|------|-------|------|------|-------|
| <b>Education</b>                                                       |               |      |      |       |      |      |       |
| No                                                                     | 591 (%29,04)  | 3,08 | 0,66 | 0,020 | 2,97 | 1,00 | 0,821 |
| Yes                                                                    | 1444 (%70,96) | 3,15 | 0,61 |       | 2,96 | 0,93 |       |
| <b>Social media</b>                                                    |               |      |      |       |      |      |       |
| No                                                                     | 783 (%38,48)  | 3,10 | 0,68 | 0,108 | 2,97 | 0,99 | 0,831 |
| Yes                                                                    | 1252 (%61,52) | 3,14 | 0,58 |       | 2,96 | 0,92 |       |
| <b>Game</b>                                                            |               |      |      |       |      |      |       |
| No                                                                     | 1278 (%62,80) | 3,10 | 0,63 | 0,006 | 3,05 | 0,94 | 0,000 |
| Yes                                                                    | 757 (%37,20)  | 3,17 | 0,61 |       | 2,81 | 0,95 |       |
| <b>Follow the news</b>                                                 |               |      |      |       |      |      |       |
| No                                                                     | 1164 (%57,20) | 3,09 | 0,64 | 0,001 | 2,95 | 0,94 | 0,776 |
| Yes                                                                    | 871 (%42,80)  | 3,18 | 0,59 |       | 2,97 | 0,96 |       |
| <b>Financial transactions</b>                                          |               |      |      |       |      |      |       |
| No                                                                     | 1486 (%73,02) | 3,10 | 0,62 | 0,000 | 2,98 | 0,92 | 0,067 |
| Yes                                                                    | 549 (%26,98)  | 3,21 | 0,62 |       | 2,89 | 1,01 |       |
| <b>Shopping</b>                                                        |               |      |      |       |      |      |       |
| No                                                                     | 927 (%45,55)  | 3,10 | 0,67 | 0,080 | 2,94 | 0,95 | 0,436 |
| Yes                                                                    | 1108 (%54,45) | 3,15 | 0,58 |       | 2,97 | 0,95 |       |
| <b>Communication</b>                                                   |               |      |      |       |      |      |       |
| No                                                                     | 757 (%37,20)  | 3,09 | 0,71 | 0,059 | 2,92 | 0,95 | 0,192 |
| Yes                                                                    | 1278 (%62,80) | 3,15 | 0,57 |       | 2,98 | 0,94 |       |
| <b>Entertainment</b>                                                   |               |      |      |       |      |      |       |
| No                                                                     | 1114 (%54,74) | 3,08 | 0,65 | 0,000 | 3,00 | 0,95 | 0,057 |
| Yes                                                                    | 921 (%45,26)  | 3,18 | 0,59 |       | 2,92 | 0,94 |       |

Of the people taking part in the study, 36.4% were male and 63.6% were female; 43.6% were aged 18–20, 24.3% were aged 21–22, 10.6% were aged 23–24, and 21.5% were aged 25 and over. Approximately 68% were 22 years of age or younger. In terms of daily usage time of information technologies, 8.75% use it for 1-2 hours, 41.92% for 3-5 hours, 35.92% for 6-8 hours, and 13.42% for 9 hours or more (as shown in Table 1). In terms of information technology devices they own, 97.10% have a smartphone, 25.95% have a tablet, 56.17% have a laptop, and 16.36% have a desktop computer (as shown in Table 2). In terms of their purposes, 70.96% use information technologies for education, 61.52% for social media, 37.20% for games, 42.80% for news, 26.98% for financial transactions, 54.45% for shopping, 62.80% for communication, and 45.26% for entertainment (as shown in Table 3). They stated that they use information technologies mostly for educational purposes. The mean attitudes of students with laptop computers towards technology were statistically higher than those without laptop computers ( $3.19 \pm 0.61$  vs.  $3.05 \pm 0.63$ , (t-test,  $p < 0.001$ )), and similarly, the mean attitudes of students with desktop computers towards technology were statistically higher than those without laptop computers ( $3.21 \pm 0.64$  vs.  $3.11 \pm 0.62$ , (t-test,  $p < 0.05$ )).

When we evaluated the information technologies in terms of usage purposes, it was seen that those who

used for education purposes ( $3.15 \pm 0.61$  vs.  $3.08 \pm 0.66$  (t-test,  $p < 0.05$ )), those who used for games ( $3.17 \pm 0.61$  vs.  $3.10 \pm 0.63$  (t-test,  $p < 0.05$ )), those who used for news purposes ( $3.18 \pm 0.59$  vs.  $3.09 \pm 0.64$  (t-test,  $p < 0.001$ )), those who used for financial transactions ( $3.21 \pm 0.62$  vs.  $3.10 \pm 0.62$  (t-test,  $p < 0.001$ )), those who used for entertainment ( $3.18 \pm 0.59$  vs.  $3.08 \pm 0.65$  (t-test,  $p < 0.001$ )) were more likely to ATT than those who did not.

Students who did not have a laptop had statistically higher mean AI anxiety levels than students who did ( $3.06 \pm 0.92$  vs.  $2.88 \pm 0.96$  (t-test,  $p < 0.001$ )).

When we evaluate information technologies in terms of their usage purposes, the average AIA levels of students who use them for gaming purposes are statistically lower than those who do not use them for gaming purposes ( $2.81 \pm 0.95$  vs.  $3.05 \pm 0.94$  (t-test,  $p < 0.001$ )).

The mean score of female students is higher than that of male students in terms of overall AI anxiety ( $3.10 \pm 0.91$  vs.  $2.71 \pm 0.96$ , (t-test,  $p < 0.001$ )). Hypothesis H5: AI anxiety differs by gender was supported. The mean of male students was higher than female students in attitude towards technology ( $3,21 \pm 0.67$  vs.  $3,08 \pm 0,59$  (t-test,  $p < 0.05$ )). The hypothesis H6 that ATT differ by gender was supported. (as shown in Table 1)

Table 4. Differences in Measured Variables by Age and Usage Period (N=2035)

| Control variable | Dependent variables         |                | Sum of Squares | sd   | Mean Square | F     | p    | Differences Between Groups |
|------------------|-----------------------------|----------------|----------------|------|-------------|-------|------|----------------------------|
| Age              | Attitude towards technology | Between groups | 4,597          | 3    | 1,532       | 3,961 | ,008 | 1 - 4                      |
|                  |                             | Within groups  | 785,556        | 2031 | ,387        |       |      |                            |
|                  |                             | Total          | 790,152        | 2034 |             |       |      |                            |
|                  | AI anxiety                  | Between groups | 18,760         | 3    | 6,253       | 7,023 | ,000 | 1 - 4                      |
|                  |                             | Within groups  | 1808,291       | 2031 | ,890        |       |      | 2 - 4                      |
|                  |                             | Total          | 1827,051       | 2034 |             |       |      |                            |
| Usage period     | Attitude towards technology | Between groups | 9,345          | 3    | 3,115       | 8,103 | ,000 | 5 - 6                      |
|                  |                             | Within groups  | 780,807        | 2031 | ,384        |       |      | 5 - 7                      |
|                  |                             | Total          | 790,152        | 2034 |             |       |      | 5 - 8                      |
|                  | AI anxiety                  | Between groups | 9,375          | 3    | 3,125       | 3,492 | ,015 | 5 - 8                      |
|                  |                             | Within groups  | 1817,677       | 2031 | ,895        |       |      | 6 - 8                      |
|                  |                             | Total          | 1827,051       | 2034 |             |       |      |                            |

Note: (1:18-20 age range; 2: 21-22 age range; 4: 25+ age) (5: 1-2 hour; 6: 3-5 hour; 7: 6-8 hour; 8: 9 + hour)

In order to measure whether the students' ATT and AIA levels differ according to age levels, analysis of variance was conducted for independent groups. The ANOVA table showed significant differences in the means of the students' ATT and AIA levels ( $p <$

0.05). A Tukey test, a post hoc analysis, was conducted to see which groups this significant difference occurred between. As a result of the test, it was determined that the mean ATT ( $x=3.20$ ) of the students in the over 25 age group were higher than the mean

for the students in the 18-20 age group ( $x=3.08$ ); the mean AIA level of the students in the over 25 age group ( $x=3.13$ ) was higher than the mean for the students in the 18-20 age group ( $x=2.93$ ); and the mean AIA level of the students in the over 25 age group ( $x=3.13$ ) was higher than the mean for the students in the 21-22 age group ( $x=2.86$ ). In summary, as students' ages increase, their attitudes toward technology also increase. Similarly, as students' ages increase, their concerns about AI also increase. (as shown in Table 4)

An analysis of variance was conducted for independent groups to determine whether students' attitudes toward technology and AI anxiety levels differed based on the duration of daily use of information technologies. The ANOVA table revealed significant differences in the students' average attitudes toward technology and AI anxiety levels ( $p < 0.05$ ). A Tukey post hoc analysis was conducted to identify the groups responsible for this significant difference. The test results revealed that those who used information technologies for 3-5 hours per day ( $x=3.11$ ) had higher attitudes toward technology than those who used them for 1-2 hours ( $x=2.95$ ); those who used them for 6-8 hours ( $x=3.13$ ) had higher attitudes toward technology than those who used them for 1-2 hours ( $x=2.95$ ); and those who used them for

9 hours or more ( $x=3.24$ ) had higher attitudes toward technology than those who used them for 1-2 hours ( $x=2.95$ ). It was determined that those who use information technologies for 1-2 hours a day ( $x=3.04$ ) had higher AI anxiety levels than those who used them for 9 hours or more ( $x=2.80$ ); and those who used them for 3-5 hours ( $x=3.00$ ) had higher AI anxiety levels than those who used them for 9 hours or more ( $x=2.80$ ). In summary, as students' daily use of information technologies increases, their attitudes toward technology improve. On the other hand, as students' daily use of information technologies decreases, their AI anxiety levels increase. (as shown in Table 4)

When we were doing the validity and reliability analysis stage of the research, we looked at internal consistency reliability, convergent validity and discriminant validity on their own before we moved on to the research method analysis. We also calculated the Cronbach alpha coefficient for internal consistency reliability, as well as the CR (composite reliability) coefficients. To analyse discriminant validity, we used the Fornell-Larcker and HTMT (Heterotrait-Monotrait Ratio) values. We're expecting the AVE (Average Variance Extracted) to be 0.5 or greater (Hair et al., 2021; Doğan, 2019).

Table 5. Measurement Model

| Constructs | Items | Loading Values | Cronbach Alfa Katsayısı | CR    | AVE   |
|------------|-------|----------------|-------------------------|-------|-------|
| <b>OGR</b> | YZK1  | 0,791          | 0,903                   | 0,928 | 0,720 |
|            | YZK2  | 0,882          |                         |       |       |
|            | YZK3  | 0,876          |                         |       |       |
|            | YZK4  | 0,851          |                         |       |       |
|            | YZK5  | 0,842          |                         |       |       |
| <b>ID</b>  | YZK6  | 0,917          | 0,809                   | 0,913 | 0,840 |
|            | YZK7  | 0,916          |                         |       |       |
| <b>STK</b> | YZK10 | 0,841          | 0,823                   | 0,889 | 0,728 |
|            | YZK11 | 0,869          |                         |       |       |
|            | YZK12 | 0,850          |                         |       |       |
| <b>YZY</b> | YZK14 | 0,920          | 0,915                   | 0,947 | 0,805 |
|            | YZK15 | 0,929          |                         |       |       |
|            | YZK16 | 0,925          |                         |       |       |
| <b>TYE</b> | TYA1  | 0,828          | 0,890                   | 0,912 | 0,635 |
|            | TYA2  | 0,744          |                         |       |       |
|            | TYA3  | 0,783          |                         |       |       |
|            | TYA4  | 0,829          |                         |       |       |
|            | TYA5  | 0,730          |                         |       |       |
|            | TYA6  | 0,859          |                         |       |       |

|            |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|
| <b>TO</b>  | TYA10 | 0,756 | 0,853 | 0,894 | 0,629 |
|            | TYA12 | 0,832 |       |       |       |
|            | TYA13 | 0,803 |       |       |       |
|            | TYA14 | 0,784 |       |       |       |
|            | TYA15 | 0,788 |       |       |       |
| <b>TKO</b> | TYA16 | 0,841 | 0,862 | 0,895 | 0,631 |
|            | TYA17 | 0,738 |       |       |       |
|            | TYA18 | 0,814 |       |       |       |
|            | TYA19 | 0,764 |       |       |       |
|            | TYA21 | 0,810 |       |       |       |
| <b>HK</b>  | TYA23 | 0,963 | 0,803 | 0,902 | 0,822 |
|            | TYA24 | 0,847 |       |       |       |

Note: OGR = Learning, ID = Job replacement, STK = Sociotechnical blindness, YZY = AI configuration, YZK= AI anxiety, TYE = Tendency to technology, TO = Negativeness of technology, TKO = Importance of technology, HK = Technology for

Examining the values in Table 5 shows that the internal consistency reliability is ensured, with Cronbach's alpha coefficients ranging from 0.803 to 0.915 and composite reliability (CR) coefficients ranging from 0.889 to 0.947. Observation of the factor loading values shows a range of 0.730–0.963. The AVE values were 0.501–0.855. If the factor loading is between 0.40 and 0.70, the AVE and CR values should be above the threshold. If the values are below the threshold, it is recommended that the expressions be

removed from the model (Hair et al., 2021). The expressions TYA7 and TYA8 for TYE, TYA9 and TYA11 for TO, TYA20 for TKO, TYA22 for HK, expressions 6, 7 and 8 for OGR, expressions 9, 10, 13 and 14 for ID, and expression 18 for STK, which were below the threshold value of the measured AVE and CR values, were removed from the model and thus convergent validity was ensured (Fornell & Larcker, 1981; Henseler et al., 2015).

Table 6. Structural Model Evaluation Results

| Model fit indices             | Value | Endogenous variables                            | R <sup>2</sup> | Structural relationship | f <sup>2</sup> | Effect size |
|-------------------------------|-------|-------------------------------------------------|----------------|-------------------------|----------------|-------------|
| <b>SRMR (Saturated Model)</b> | 0.101 | Attitude toward technology tendency (TYE)       | 0.006          | AIA→TYE                 | 0.006          | Very small  |
| <b>SRMR (Estimated Model)</b> | 0.130 | Negativity of technology (TO)                   | 0.076          | AIA→TO                  | 0.083          | Small       |
|                               |       | Contribution and importance of technology (TKO) | 0.003          | AIA→TKO                 | 0.003          | Very small  |
|                               |       | Technology for everyone (HK)                    | 0.003          | AIA→HK                  | 0.003          | Very small  |

Table 6 presents the structural equation model fit indices, coefficient of determination (R<sup>2</sup>), and effect size (f<sup>2</sup>) values calculated and interpreted for the research model.

The Standardised Root Mean Square Residual (SRMR) value was examined in the evaluation of model fit. An SRMR value below 0.08 indicates good model fit, while a value below 0.10 indicates acceptable model fit (Hair et al., 2018). As a result of the analysis, the SRMR value for the saturated model was found to be 0.101 and the SRMR value for the estimated model was found to be 0.130, and it is considered that this relevant indicator value is within acceptable model limits.

Within the scope of structural model analysis, R<sup>2</sup> values were examined to assess the explanatory power of the model. According to the analysis results in Table 4, it is understood that artificial intelligence anxiety explains the dimensions of the tendency towards technology (R<sup>2</sup>=0.006), the negativity of technology (R<sup>2</sup>=0.076), the contribution and importance of technology (R<sup>2</sup>=0.003), and technology for everyone (R<sup>2</sup>=0.003) at a low level.

Another indicator in Table 4 is that the f<sup>2</sup> values were examined to determine the magnitude of the effect of the independent variables on the dependent variable. In this context, f<sup>2</sup> values of 0.02, 0.15, and 0.35 indicate small, medium, and large effect sizes, res-

pectively (Hair et al., 2018). According to the analysis results, artificial intelligence anxiety has a small effect on the negativity dimension of technology ( $f^2 = 0.083$ ), while the effect size on the dimensions of

technological orientation ( $f^2 = 0.006$ ), technological contribution and importance ( $f^2 = 0.003$ ), and technology for all ( $f^2 = 0.003$ ) is very low.

Table 7. Fornell-Larcker Criterion

|            | HK           | ID           | OGR          | STK          | TKO          | TO           | TYE          | YZK          | YZY          |
|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>HK</b>  | <b>0.907</b> |              |              |              |              |              |              |              |              |
| <b>ID</b>  | -0.045       | <b>0.916</b> |              |              |              |              |              |              |              |
| <b>OGR</b> | -0.037       | 0.386**      | <b>0.849</b> |              |              |              |              |              |              |
| <b>STK</b> | -0.036       | 0.676**      | 0.333**      | <b>0.853</b> |              |              |              |              |              |
| <b>TKO</b> | 0.374        | 0.096**      | -0.168**     | 0.185**      | <b>0.794</b> |              |              |              |              |
| <b>TO</b>  | -0.033       | 0.159**      | 0.360**      | 0.136**      | -0.201       | <b>0.793</b> |              |              |              |
| <b>TYE</b> | 0.357**      | -0.074**     | -0.086**     | 0.015        | 0.397**      | -0.207**     | <b>0.797</b> |              |              |
| <b>YZK</b> | -0.052*      | 0.820**      | 0.613**      | 0.852**      | 0.060*       | 0.272**      | -0.077**     | <b>0.860</b> |              |
| <b>YZY</b> | -0.045       | 0.586**      | 0.382**      | 0.637**      | 0.030        | 0.241**      | -0.102       | 0.708        | <b>0.925</b> |

Note: \* $p < 0,05$ , \*\* $p < 0,01$ ; HK = Technology for all, ID = Job replacement, OGR = Learning, STK = Sociotechnical blindness, TKO = Importance of technology, TO = Negativeness of technology, TYE = Tendency to technology, YZK= AI anxiety, YZY = AI configuration

In consideration of the discriminant validity analysis results presented in Table 7, Fornell & Larcker (1981) stated that the square root of AVE of the variances in the study should have a greater value than the correlations with other latent constructs. Consequently, the discriminant validity of the research scales was assured. According to the results, a significant and negative correlation was found between stu-

dents' AI anxiety and their tendency to technology ( $r = -0,077, p < 0,01$ ), and between AI anxiety and technology for all ( $r = -0,052, p < 0,05$ ). A positive linear correlation was found between AI anxiety and the negativeness of technology ( $r = 0,272, p < 0,01$ ), and between AI anxiety and the contribution and importance of technology ( $r = 0,060, p < 0,05$ ).

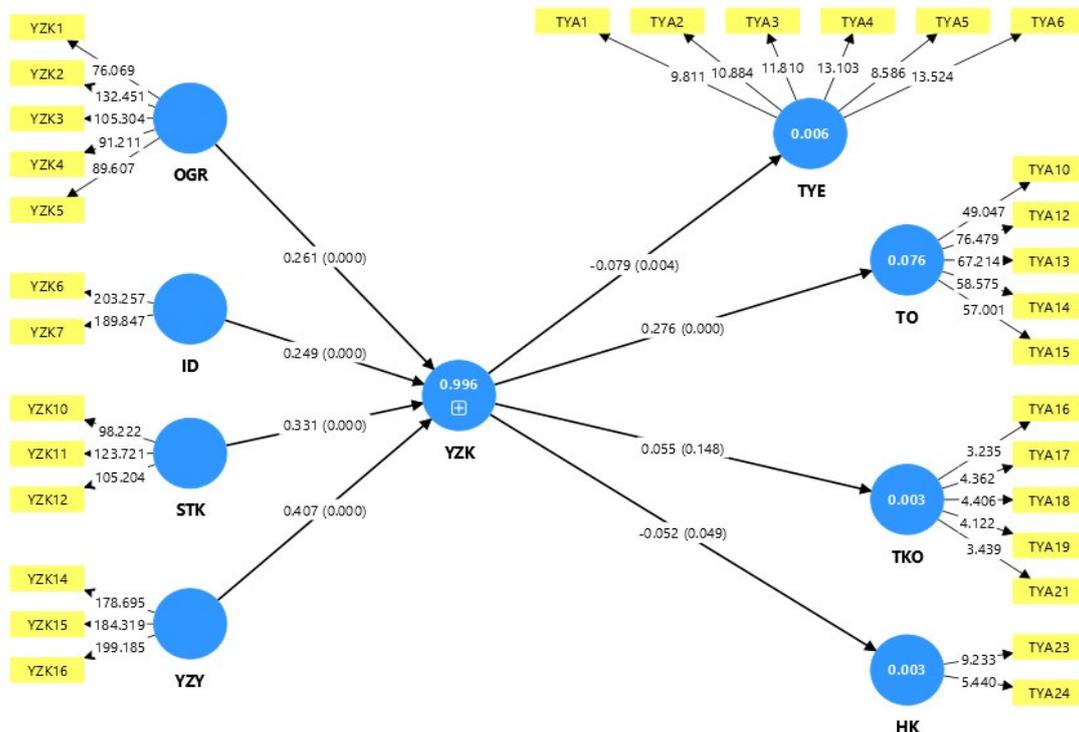


Figure 1. Path Coefficient (PLS SEM Approach)

Source: Figure by the Authors

Note: OGR = Learning, ID = Job replacement, STK = Sociotechnical blindness, YZY = AI configuration, YZK= AI anxiety, TYE = Tendency to technology, TO = Negativeness of technology, TKO = Importance of technology, HK = Technology for all

Figure 1 shows the standardized regression coefficients between the latent variables of the research model and their statistical significance, as well as the

t statistics between the latent variables and the expressions.

Table 8. Hypothesis Testing

| Hypothesis | Relationship | $\beta$ | Standard error | T statistics | p values | Decision |
|------------|--------------|---------|----------------|--------------|----------|----------|
| H1         | YZK→TYE      | -0,079  | 0,027          | 2,924        | 0,004**  | Accepted |
| H2         | YZK→TO       | 0,276   | 0,023          | 11,832       | 0,000*** | Accepted |
| H3         | YZK→TKO      | 0,055   | 0,038          | 1,448        | 0,148    | Rejected |
| H4         | YZK→HK       | -0,052  | 0,026          | 1,971        | 0,049*   | Accepted |

The significance of the path coefficients was tested in the first stage of the research model. As seen in Table 8, the H1 hypothesis, which was established for the tendency to technology, that AIA has a negative effect, was supported ( $\beta=-0,079$ ;  $p<0,05$ ). The H2 hypothesis, which was established for the negativity of technology, that AIA has a positive effect, was supported ( $\beta=0,276$ ;  $p<0,001$ ). The H3 hypothesis, which was established for the contribution and importance of technology, that AIA has a negative effect, was not supported ( $\beta=0,055$ ;  $p>0,05$ ). It was understood that the H4 hypothesis, which was established for technology for all, that AIA has a negative effect, was supported ( $\beta=-0,052$ ;  $p<0,05$ ).

Table 8 presents the  $\beta$  coefficients and hypothesis test results related to the research model. According to the analysis results, artificial intelligence anxiety has a negative and significant effect on the tendency towards technology ( $\beta = -0.079$ ;  $p < 0.01$ ), and this finding shows that as students' anxiety levels towards artificial intelligence increase, their tendency to turn to the field of technology decreases. Therefore, it is understood that the H1 hypothesis established in the research hypothesis is supported.

The study found that artificial intelligence anxiety has a positive and significant effect on the negative aspect of technology ( $\beta = 0.276$ ;  $p < 0.001$ ). This result indicates that as the level of anxiety about artificial intelligence increases, students' negative perceptions of technology also increase. Thus, the H2 hypothesis used in the study is supported.

The study found that the effect of artificial intelligence anxiety on the dimension of technology's contribution and importance was not statistically significant ( $\beta = 0.055$ ;  $p > 0.05$ ). This indicates that students' artificial intelligence anxieties did not significantly affect their perceptions of technology's social contribution. Therefore, Hypothesis H3 was not supported.

The study determined that artificial intelligence anxiety has a negative and significant effect on the technology dimension for everyone ( $\beta = -0.052$ ;  $p < 0.05$ ). Accordingly, it was found that as the level of anxiety towards artificial intelligence increases, students' perception that technology is suitable for

everyone decreases, supporting the established H4 hypothesis.

## 5. Discussion

The current study investigated the relationship between students' AI anxiety and their attitudes toward technology. It also examined whether gender had an impact on both AI anxiety and attitudes toward technology.

According to the results of the structural equation model tested to examine the relationship between students' artificial intelligence anxiety and the sub-dimensions of their attitudes toward technology, a negative relationship was found between students' artificial intelligence anxiety and their tendency toward technology. According to this result, as predicted in the study, as students' levels of artificial intelligence anxiety increase, their attitudes toward technology decrease (H1 accepted). A positive relationship was found between students' artificial intelligence anxiety and their negativity of technology. Accordingly, as predicted in the study, as students' levels of artificial intelligence anxiety increase, their views on the negativity of technology increase (H2 accepted). A statistically insignificant positive relationship was found between students' artificial intelligence anxiety and the contribution and importance of technology (H3 rejected). A negative relationship was found between students' AI anxiety and technology for everyone. Accordingly, as predicted in the study, as students' AI anxiety levels increase, their tendencies toward technology for everyone decrease (H4 accepted). The negative correlation between anxiety about artificial intelligence and the propensity to use technology suggests that anxiety inhibits the use of technology.

The findings of this study indicate a negative relationship between students' artificial intelligence anxiety and their propensity to use technology. This result suggests that higher levels of AI-related anxiety may act as a psychological barrier that discourages individuals from engaging with technological tools and systems. From the perspective of technology acceptance research, this finding is consistent with the

broader literature indicating that anxiety can reduce individuals' willingness to adopt or interact with new technologies. Technology acceptance models emphasize that psychological factors such as perceived risk, uncertainty, and anxiety can negatively influence individuals' attitudes toward technology and their behavioral intentions to use it. Therefore, the negative association identified in this study may reflect the role of AI anxiety as a factor that weakens students' openness to technological engagement.

The results also show that as AI anxiety increases, individuals tend to focus more strongly on the potential negative consequences of technological development, such as unemployment, privacy violations, and the perceived loss of human control over intelligent systems. This tendency may contribute to the formation of more cautious or resistant attitudes toward technological innovation. However, it is important to note that such perceptions may not stem solely from anxiety itself but may also be related to limited knowledge or misconceptions about AI technologies. Previous studies suggest that misunderstandings regarding the capabilities and limitations of AI can amplify risk perceptions and reinforce technology-related fears. As accurate information, transparency, and familiarity with AI technologies increase, individuals may develop a more balanced understanding of both the risks and benefits associated with these systems. In this sense, education and public awareness may play a critical role in mitigating anxiety-driven negative perceptions.

Another important finding of the study is that increasing levels of AI anxiety appear to weaken individuals' belief that technology is accessible and learnable by everyone. This result suggests that anxiety may undermine inclusive perceptions of technology education, leading individuals to question whether technological knowledge and skills can realistically be acquired by all students. Such perceptions may reinforce negative attitudes toward initiatives aimed at promoting technology education for broader segments of society. Nevertheless, the literature emphasizes that inclusive educational policies and appropriate pedagogical approaches can strengthen individuals' confidence in their ability to learn and use technology. Educational environments that emphasize accessibility, support, and hands-on engagement with technology may help counteract the exclusionary perceptions associated with AI anxiety.

Although the direct relationship between AI anxiety and attitudes toward technology has not been widely examined in previous research, related studies provide indirect support for the findings of the present study. For example, Kaya et al. (2024: 504) reported a positive relationship between individuals' level of computer usage and their general positive attitudes toward AI, suggesting that familiarity with technology may reduce uncertainty and foster more

favorable perceptions. Similarly, Emon and Khan (2025: 7) found that attitudes toward technology significantly predicted professionals' intention to use AI in the Bangladeshi context, highlighting the importance of positive technological attitudes in shaping technology adoption behaviors. In the educational context, Amiri et al. (2024) also argued that students' positive attitudes toward AI facilitate their acceptance of AI-based technologies.

Furthermore, research conducted among managers of small and medium-sized enterprises demonstrates that technological knowledge plays a critical role in the adoption of emerging technologies. For instance, Polas et al. (2022) found that AI knowledge had a positive and significant effect on the adoption of blockchain technology. In addition, the perceived advantages of AI and the perceived ease of use of AI were also found to positively influence technology adoption. These findings align with technology acceptance frameworks, which emphasize the importance of perceived usefulness and perceived ease of use in shaping attitudes toward technology and subsequent adoption behaviors. Taken together, these results suggest that increasing individuals' knowledge and familiarity with AI technologies may reduce anxiety and contribute to more positive attitudes toward technology.

Overall, the findings of this study highlight the importance of addressing AI-related anxiety in educational contexts. If students' concerns about AI remain unaddressed, such anxieties may negatively influence their engagement with technological learning environments and their perceptions of technological opportunities. Therefore, educational institutions may play a key role in fostering balanced perceptions of AI by integrating AI literacy, critical understanding of technology, and practical learning experiences into educational programs.

The fifth hypothesis suggests that female students are more anxious about artificial intelligence than male students. Statistically significant differences were found in AI anxiety based on gender. These findings support the findings of previous research that found women's AI anxiety to be higher than men's (Ayduğ & Altınpulluk, 2023; Uçar et al., 2024; Cho & Seo, 2024; Çetiner & Çetinkaya, 2024: 160; Köse, 2025: 578; Alkan, 2025: 11; Ongün et al., 2024; Laupichler et al., 2024; Pinto dos Santos et al., 2019; Lukić et al., 2023). On the other hand, it contradicts studies that show no effect of gender on attitudes towards AI (Kaya et al., 2024; Filiz et al., 2022: 47; Gümüş & Uysal Kasap, 2022; Başer et al., 2021; Ulukapı Yılmaz & Yılmaz, 2024: 185). When considered within a sociocultural framework of risk perception and uncertainty tolerance, the significant difference in AI anxiety between men and women shows that women generally perceive technological risks as higher and are more sensitive to uncertainty and loss of

control. Combined with the 'unpredictability' of AI, this situation can increase anxiety. Women may also be more concerned about the ethical and societal consequences of AI. Conversely, men may downplay technical risks and adopt a more benefit-oriented approach. In the context of social roles and the labour market, AI technologies can directly affect administrative, service and care occupations, which are predominantly performed by women. Considering the potential for automation of AI technologies, this situation may increase job security concerns among women. In terms of perceived technological self-efficacy, women reported lower self-efficacy regarding AI technologies on average. Low self-efficacy is a strong predictor of increased anxiety. Even with the same level of knowledge, this mechanism can explain why women report higher anxiety about AI.

The sixth hypothesis is that the average attitude of male students towards technology is higher than that of female students. These gender-related findings from this study support previous research in the literature. There were significant differences in students' interest in technology, their attitudes towards its inclusion in the school curriculum, and their views on technology-related careers between girls and boys (Volk & Yip, 1999; Raat & de Vries, 1985; Weinburgh, 1995: 387; Ian Robertson et al., 1995: 73; Colley et al., 1994: 129; Elvstrand et al., 2012; Bozdemir et al., 2021: 40; Boser et al., 1998: 12). On the other hand, attitudes towards the use of technology did not differ by gender (Kılınc et al., 2016; Francis, 1993). Although students are interested in technology, research has found that they lack sufficient knowledge of technology-related concepts (Bame, 1993). Another gender-based study reported that interest in technological themes is influenced by early childhood. Therefore, efforts to improve early childhood education and primary school education to increase girls' interest and motivation in technology are emphasized (Rasinen et al., 2009: 367). When considered in the context of gender roles and expectations, this significant difference in attitudes towards technology in favour of men reveals that, in many societies, technology, engineering and computer science fields are considered to be "men's work". Girls are directed towards more social and care-oriented roles, while boys are directed towards technical and instrumental roles. This situation directly affects self-perceived technological competence. Consequently, while men may believe they are more 'naturally inclined' towards technology, women may rate their own competence lower, even if they are successful in technology-related fields. Overall, it is thought that gender differences in attitudes towards technology are not innate, but are largely shaped by sociocultural and educational factors. It is believed that these differences can be reduced or even eliminated through appropriate pedagogical approaches, role models and equal opportunities.

## 6. Conclusion

The scientific aim of this study is to understand students' AI anxiety and attitudes toward technology and to investigate how attitudes toward AI influence attitudes toward technology. While numerous separate studies have been conducted on AI anxiety and attitudes toward technology, this research stemmed from the need to address this gap, as no studies directly examine the relationship between these two concepts. The study determined that gender, age, and duration of information technology use had statistically significant effects on students' AI anxiety and attitudes toward technology. This study revealed that women had higher AI anxiety than men, while their attitudes toward technology were lower. Furthermore, it was understood that as participants' duration of information technology use increased, their attitudes toward technology improved, while their AI anxiety decreased. Students' AI anxiety levels were found to influence their attitudes toward technology.

When the analysis results are evaluated together, they show that the magnitude of the effect of AI anxiety on the dimensions of attitudes towards technology is generally low, indicating that AI anxiety has a limited effect in explaining students' attitudes towards technology. Thus, these results suggest that students' attitudes towards technology cannot be explained solely by AI anxiety, and it is recommended that other variables that may be effective in future studies be included in the model.

The findings of this study have significant implications, both theoretical and practical, for future research. These implications and recommendations are presented below under separate headings.

The finding that female students have higher levels of AI anxiety suggests that there is a need to examine gender-based technology experiences more deeply. Future research could include qualitatively investigating the reasons for women's AI anxiety, such as self-efficacy perception, frequency of interaction with technology, lack of role models, and ethical and job security concerns. It could also involve testing the effectiveness of supportive training programmes for women, such as mentoring, awareness campaigns and confidence-building practices, in reducing AI anxiety.

The negative relationship between anxiety about artificial intelligence and the tendency to use technology indicates that anxiety inhibits technology use. In this regard: Teaching models for artificial intelligence literacy that are both applied and understandable can be developed. Course content and learning environments could be designed to encourage students to view artificial intelligence as a supportive tool rather than a threat. Experimental studies can examine the effect of psychoeducational programmes aimed at reducing anxiety on attitudes towards technology.

Future studies on the relationship between artificial intelligence anxiety and attitudes towards technology could investigate: The mediating or moderating role of variables such as technological self-efficacy, digital literacy, learning motivation and innovativeness could be investigated. This would enable the relationship to be explained within a more comprehensive theoretical framework.

When interpreting the results of this study, some limitations must be acknowledged. The fact that the study was conducted with only university students in the Osmaniye province limits its generalisability. In this study, analyses were conducted based solely on the gender variable in line with the research objective. Although the participants' unit and department information is included in the data set, these variables were not included in the analysis process because the sample size did not show a homogeneous distribution based on unit/department, and the number of participants in some departments was insufficient for statistical analysis. This situation has been considered a limitation of the study. It is thought that future studies involving larger samples from different universities and regions will make the findings more generalisable. However, using qualitative methods such as in-depth interviews or focus group studies in future studies may allow for a more comprehensive examination of the subject. It may also be worthwhile for future studies to examine the mediating or moderating role of variables such as technological self-efficacy, digital literacy, and innovation.

The results of this study can be generalised by testing them in different groups. For example, comparative studies could be conducted with different age groups, academic disciplines or educational levels (secondary education, graduate education, teachers, etc.). Cross-cultural studies can examine the relationship between AI anxiety and cultural factors, which may provide valuable insights into the role of cultural influences in shaping perceptions of AI and its implications for societal and cultural contexts.

Research findings also inform education policy: For example, it is important to emphasise that students' emotional characteristics should be taken into account when integrating artificial intelligence into educational institutions. The importance of using inclusive and anxiety-reducing language when introducing AI-based applications should be emphasised.

Overall, this study emphasises the significant impact of AI anxiety on attitudes towards technology, highlighting the importance of preventive, supportive and inclusive approaches in future research. Taking gender-based differences into account, in particular, will contribute to the more effective and equitable use of AI technologies in education.

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