Middle School EFL Students' Attitudes Towards Artificial Intelligence: A Mixed-Methods Analysis ᵈᵒⁱ

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Abstract

This research investigates Turkish middle school students' attitudes towards the use of AI in English language learning, drawing on a mixed-methods design. It involved 165 public-school students in Istanbul during the 2025-2026 academic year. During the quantitative phase, the Artificial Intelligence Attitude Scale was administered; to extend those findings, researchers conducted semi-structured written interviews with 24 students. From this study, it has emerged that while the students generally held a positive view of AI, with low resistance to it, their eagerness to be trained in AI remained fairly modest. In this process, experience with AI appeared as a crucial factor affecting these attitudes, while boys seemed to hold a higher belief in AI's potential. Neither academic achievement nor the level of parental education significantly influenced attitudes. Qualitative results reveal that such optimism is based on expected pragmatic benefits: improved speaking practice, better pronunciation, and vocabulary enhancement. On the other hand, students also mentioned several concerns: the reduction of human contact, ethical hazards, overdependence on AI, and a redefinition of the teacher's role. This study emphasizes that the approach should be human-centered and critical in order to preserve and support the pedagogical role of the teacher during the integration of AI into learning. Besides, it underlines that embedding AI literacy within the framework of educational curricula is vitally important. Eventually, it is indicated that successful use of AI in education, especially in language teaching, depends more on the ethical awareness and responsible participation of students than on simple access to technology.

Keywords: Artificial Intelligence, Student Attitudes, EFL, Middle School Students.

JEL Codes: I20, I21, I29

1. Introduction

Artificial Intelligence (AI) is increasingly reshaping the thought processes, behavioral patterns, as well as social interactions of individuals within web-based platforms (Çolak Yazıcı & Erkoç, 2024). Described as a human intelligence simulation process involving processes like reasoning, problem-solving, and adaptation (Gondal, 2018; Obschonka & Audretsch, 2020), AI has become a crucial aspect of innovations that can be found beyond various sectors, especially education, as it completely changes administrative, learning, as well as learning processes (Chen, Chen & Lin, 2020). With advancements in AI innovations towards being more adaptable, predictive, as well as human-centered (McCarthy, 2004; Arrieta et al., 2020), producing and incorporating these innovations into learning processes has created controversial questions regarding how individuals react towards these innovations (Krenn et al., 2022). Currently, researches that have appeared relatively lately stress that AI cannot simply be a learning assistant, since it is a learning stimulator that has a positive impact on the achievement of English learning, L2 motivation, and self-regulated learning (Wei, 2023). Therefore, the international educational community has been seeing the increasing use of AI platforms in order to transform education (Cooper, 2023; Yang, 2022).

Bajcsy, Aloimonos and Tsotsos (2017) further divided educational AI into three types, namely student-centered, teacher-centered, and system-centered AI. Student-centered AI applications like chatbots, automated writing evaluation (AWE), and intelligent tutoring systems require the actual involvement of the learner (Son, Ružić, & Philpott, 2023). The successful implementation of these applications largely depends upon the students' attitudes, perceptions, and cooperation (Ajzen & Schmidt, 2020; Kemp et al., 2019). However, apart from institutional acceptance, current studies strongly suggest that the efficacy of AI implementation is intricately intertwined with interpersonal/communicational parameters like Teacher Immediacy (TI) and Teacher- Student Rapport (TSR) and largely impacts students' Willingness to Communicate (WTC) during the current digitalized context (Zhi & Wang, 2024).

However, for younger students, general attitudes toward new technologies aren't solely determined by cognitive usefulness. They may be affected by a variety of factors including personality variables and environment. For instance, in settings with meager resources, attitudes might be moderated. For a deeper understanding of the implications of such attitudes from a theoretical point of view, a Technology Acceptance Model (TAM) is highly helpful. According to the Technology Acceptance Model introduced by Davis (1989), user acceptance of a new technological tool is mostly a result of perceptions of its usefulness and ease of use. Although this study does not study the general attitudes of technological use without focusing upon specific aspects of the Technology Acceptance Model, this model highlights one of the most important lessons of effective incorporation—the need for a positive attitude among the students (Venkatesh & Bala, 2008). AI tools may also convey additional symbolic value. Building on Warschauer's (2003) and Buckingham's (2007) points about the increased value of technology in conditions of scarcity, this article introduces the term "appeal of deprivation" to describe such instances. This premise implies that AI tools for students with limited digital opportunity may present a gateway to opportunity and, through this, enhance their value. In a reaction to such dynamics, international organizations emphasize the development of ethical and cognitive competencies for inclusion and equity (Miao, Holmes, Huang & Zhang, 2021; UNESCO, 2024).

Middle school students are also an essential target population during this transition as they begin to establish lifelong behavior concerning the use of technology (Sultana et al., 2025). Moreover, the promotion of AI awareness, possibly through gamification and educational instruction, plays the pivotal role of helping students achieve informed perceptions (Kalafat Çat & Huseynova, 2025; Kil, Altınkaynak and Göktur, 2025). Research regarding middle school students' perceptual views through metaphoric analysis indicates that these people view the use of AI with an optimistic and positive stance (Demir & Güraksın, 2022; Şerbetcioğlu, 2024). However, they tend to view AI based upon tangible "robot" and "mechanical" aspects (Akbay & Yıldırır, 2024). Even students from underdeveloped areas tend to perceive AI as an enabler to access information regardless of their ability to perceive AI limitations (Gök et al., 2025). Moreover, Kim and Lee (2024) also emphasized that middle school students from socio-cultural underprivileged areas could display considerably more optimistic views concerning structured AI educational views, pointing out the role of technology as an equalizer during this period.

Evidences point to the direct effect of AI on the skills acquired by this age group, especially for language education (Rusmiyanto et al., 2023). In the native language (L1) context, specifically Turkish, generative AI applications such as ChatGPT have proven effective in promoting text writing, creative thinking, and critical thinking (Dal & Tunagür, 2025; Song & Song, 2023). In the English as a Foreign Language (EFL) setting, students are highly motivated to apply the AI assistants, such as Siri, to practice speaking (Haryanto & Ali, 2019), while they are highly impressed by the AI-generated corrective answer for improving EFL proficiency (Hou, He & Cuigong, 2024). Gender differences are also mentioned in the perspective about the application of AI, where the general attitudes are positive, especially for females, but male

students, including those in teacher education programs, have higher beliefs in the application's intellectual advantages (Pokrivcakova, 2023). However, this integration has some drawbacks as well. Teachers have commented on the fact that, though AI offers efficiency and rapidity, it may also bring laziness or a mere surface-level understanding on the part of the students (Dişlioğlu et al., 2025).Though these results show some very positive effects on skills and overall attitudes, this particular topic of attitude towards AI and the learning of English languages in the Turkish culture has been unexplored (Luckin, 2017; Reiss, 2021). Middle school students learn AI as part of their school life, but their relations with AI have not been explored adequately in Türkiye either. This topic has been considered useful as it encompasses understanding young students' perspectives on AI as an assisting tutor. For this purpose, this research will focus on determining the attitudes of middle school students towards AI and English learning techniques within the culture of Türkiye.

Accordingly, the following hypotheses and research question guide the study:

H1: Students who have previously been exposed to AI tools exhibit more positive attitudes toward AI compared to students who have not been exposed.

H2: Students' attitudes toward AI differ significantly across different grade levels.

H3: Internet access at home significantly influences students' adoption and resistance to AI.

H4: Gender differences significantly influence students' attitudes toward AI.

RQ1: Is there a relationship between students' attitudes toward AI and their academic achievement or their parents' education level?

2. Method

2.1. Research Design

This study is a mixed-methods study in order to exhaustively explore middle school students learning English as a foreign language (EFL) attitudes toward artificial intelligence (AI). Mixed methods are defined as the researcher combining qualitative and quantitative strategies, concepts, and methods within one study or a series of sequential studies (Creswell, 2003; Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 1998). Within this study, the explanatory sequential design was borrowed from mixed methods designs. It involves a two-stage data collection and analysis process. During the first stage, quantitative data are collected and analyzed. During the current study, the first stage involves measuring the general attitude levels of students toward AI and whether the attitudes differ based on demographic variables using the "Artificial Intelligence Attitude Scale." During the second stage, qualitative data are collected and analyzed to explain, elaborate on, or generalize the quantitative findings achieved in the initial stage. During the second phase of this study, qualitative data were collected and analyzed from sampled students through a "Semi-Structured Written Interview Form" to gain deeper understanding into noteworthy or emergent findings (e.g., trends in specific attitude dimensions, noteworthy group differences, etc.) achieved from the quantitative analysis. This approach aims primarily to determine the general state of attitudes and then to uncover the underlying causes using qualitative methods. In this way, it seeks to provide a more comprehensive answer to the research problem.

2.2. Participants

The study's participant group consisted of middle school students in Istanbul attending state schools under the Ministry of National Education during the 2025-2026 academic year who were learning English as a foreign language. Using a purposive sampling method, students were included in the study if they met the following criteria: (a) were enrolled in grades 5-8, (b) received compulsory English education as part of the national curriculum, (c) took additional elective English courses and received at least 7-9 hours of English education per week, and (d) voluntarily participated in the study with their parents' permission. A total of 165 middle school students participated in the quantitative phase of the study, 91 (55.15%) of whom were girls and 74 (44.84%) were boys. For the qualitative phase, written interviews were conducted with 24 students selected from the quantitative sample to reflect the diversity in grade level, experience with artificial intelligence use, and attitude scores. Care was taken to replicate the demographic representation in the qualitative participants to reflect the quantitative sample, employing a maximum diversity sampling strategy.

2.3. Data Collection

In the quantitative approach, the Attitude Scale Towards Artificial Intelligence (AIAS) designed by Alan et. al. (2024) and the Demographic Information Form, designed by the researchers, was used. In the quantitative approach, Semi-Structured Written Interview Form, prepared by the researchers and the experts, was used. Attitude Scale towards Artificial Intelligence (AIAS): This 29-item scale uses a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) and assesses attitudes towards artificial intelligence among students. Developed by Alan et. al. (2024) specifically for use among middle school-going pupils, the scale has been validated and tested for reliability. The Attitude Scale towards Artificial Intelligence has four subscales: Interest in AI Learning, Adoptability of AI, Belief in the Power

of AI, and Resistance to AI. Both the Attitude Scale towards Artificial Intelligence and its subscales include both positively and negatively framed statements. The Adoptability of AI and the Resistance to AI subscales include negative statements. These statements are reverse-scored during the test so that the higher score represents more positive attitudes towards AI on all the subscales. During the scale development process, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted for construct validity, and the fit indices were reported as acceptable and excellent. The Cronbach's Alpha internal consistency coefficient for the entire scale was calculated as .881. The internal consistency coefficients for the sub-dimensions were found to be .828, .738, .703, and .816, respectively. The lowest score on the scale was 29, and the highest was 145. Along with the scale, a demographic information form was also administered, containing questions about students' grade level, gender, final report card grade point average, home internet access status, technological devices they own (phone, tablet, computer), parents' education level, and whether and for what purposes they had previously used artificial intelligence. Semi-Structured Written Interview Form: As the second stage, following an explanatory sequential design, a semi-structured written interview form developed by the researchers was used to understand, supplement, and deepen the fundamental reasons, perceptions, and experiences shaping students' attitudes towards artificial intelligence. While the quantitative data of the study identified general attitude levels and group differences, it did not fully explain why students held specific views or how their experiences with artificial intelligence influenced these attitudes. Therefore, interviews were conducted to provide explanatory information and contextual meaning to the statistical results. The semi-structured interview questions were developed in accordance with the sub-dimensions of the Artificial Intelligence Attitude Scale (Interest-Desire, Acceptance, Belief in the Power of AI, and Resistance) and specifically focused on students' experiences with artificial intelligence in English language learning. The questions aimed to investigate how students use AI tools, their perceived benefits and challenges, reasons for acceptance or resistance, and concerns regarding ethical or social consequences. In this way, it was intended that qualitative findings would establish explanatory connections with quantitative results, in accordance with an explanatory sequential mixed methods design. The form consists of five open-ended questions designed to reveal students' thoughts, experiences, and expectations regarding the sub-dimensions of the attitude scale and focused on English language learning. Prior to the data collection process, ethical committee approval was obtained from the Yıldız Technical University Social and Human Sciences Ethics Committee on October 1, 2025, with approval number 2025.10. Students and parents were informed about the purpose of the research, and participation was voluntary. Informed consent was obtained from students and parents.

2.4. Data Analysis

The quantitative and qualitative data collected in the study were analyzed separately, and then the findings were integrated in the final interpretation phase.

Quantitative Data Analysis:

In the first stage, the IBM SPSS Statistics 22.0 software package was used to analyze the collected quantitative data. Descriptive statistics (frequency, percentage, mean, standard deviation) were used to determine the demographic characteristics of the students and their scores on the Artificial Intelligence Attitude Scale (AIAS) and its subscales. The distribution of the data was assessed using both the Kolmogorov-Smirnov and Shapiro-Wilk tests, both of which indicated non-normal distribution ($p < .05$). Accordingly, non-parametric tests were employed: the Mann-Whitney U test for comparisons between two groups and the Kruskal-Wallis H test for comparisons across more than two groups. The significance level was set at $p < .05$.

Qualitative Data Analysis:

Qualitative data content analysis was performed to complement the statistical findings with in-depth insights based on the sub-dimensions of the AI Attitude Scale: Interest-Desire, Adoption, Belief in the Power of AI, and Resistance (Braun & Clarke, 2006). In this respect, all interview responses were read repeatedly to acquire familiarization. Then, meaningful units related to attitudes toward AI were open-coded. The codes were reviewed and refined to initial categories, and these categories were grouped under the pre-defined dimensions of the scale. In addition, a hybrid analysis was utilized where deductive coding based on the scale dimensions drove the structure, and inductive codes emerging from students' responses were integrated to capture unanticipated themes. This enabled the analysis not only to be true to the theoretical framework but also sensitive to unique voices and experiences of participants. To assure reliability, the data were reviewed independently by three coders; coding discrepancies were discussed and resolved by consensus. Inter-coder reliability was calculated using the formula determined by Miles and Huberman (1994), and the level of agreement was 91%, which is well above the acceptable levels. Final themes were then tabulated and supported with verbatim student quotes to increase trustworthiness and to allow the reader to engage with the original voices of participants.

Following the logic of the explanatory sequential design, both quantitative and qualitative analyses were integrated during the interpretation of findings. Such a design of the study allowed the contextualization of statistical findings using students' narratives. For example, gender-based differences in "Belief in the Power of AI" were elucidated by contrasting male and female student comments about AI trust and usefulness. Correspondingly, positive attitudes among students with AI experience were interpreted in light of their references to chatbot use, grammar-checkers, and interactive apps. In these cases, direct quotations were chosen to provide concrete, human-centered explanations that could enrich statistical findings.

Limitations of the Study

Several limitations of the present study should be acknowledged. First, due to the fixed sample size (n=165) and the specific characteristics of the participant group, the assumptions of normal distribution for the quantitative data could not be met. Consequently, non-parametric statistical analyses (Mann–Whitney U and Kruskal–Wallis H tests) were employed. This methodological choice necessitates caution when generalizing the findings to larger or more diverse populations. Nevertheless, the use of an explanatory sequential mixed-methods design helped mitigate this limitation by supplementing the quantitative findings with in-depth qualitative data, thereby providing a more comprehensive and context-sensitive interpretation of the results. Second, the study was conducted within a specific group of state middle schools located in Istanbul, Türkiye. The participants were middle school students (Grades 5–8) enrolled in intensive English programs, receiving between seven and nine hours of English instruction per week. As a result, the findings should be interpreted carefully and may not be directly generalizable to students in other geographical regions, those from different socio-economic backgrounds, or learners following a standard English curriculum with fewer instructional hours. Future research incorporating a wider range of school types and geographical contexts would contribute to strengthening the external validity of the findings.

3. Findings

This section presents quantitative analysis findings regarding the demographic characteristics of middle school students participating in the study, their scores on the AI attitude scale, and whether these scores differed according to various variables.

3.1. Normality Test Results and Descriptive Statistics

In order to determine the statistical analysis methods to be used in the study, the normality of the scores obtained from the subscales and the overall scale was examined. Since the sample size (N=165) was greater than 50, the normality assumption was analyzed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The normality test results are presented in Table 1.

Table 1. Results of the Normality Test for Attitude Scores

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Interest and Desire Factor	,100	165	,000	,954	165	,000
Adoption Factor	,125	165	,000	.928	165	,000
Belief Factor	,081	165	,010	,969	165	,001
Resistance Factor	,113	165	,000	.956	165	,000
Overall Attitude	,052	165	,200*	,983	165	,039

When examining Table 1, according to the Shapiro-Wilk test results, the "Interest and Desire" (p=.000), "Adoption" (p=.000), "Belief" (p=.001), "Resistance" (p=.000), and "General Attitude" (p=.039) scores do not meet the assumption of normal distribution at the p < 0.05 significance level. The Kolmogorov-Smirnov test results also support that normal distribution is not met for the four sub-dimensions. Therefore, it was decided to use non-parametric tests (Mann-Whitney U, Kruskal-Wallis H, Spearman Correlation) in the analysis of the data. Descriptive statistics regarding the scores obtained by the students participating in the study on the Artificial Intelligence Attitude Scale (AIAS) and its subdimensions are presented in Table 2.

Table 2. Descriptive Statistics for the Artificial Intelligence Attitude Scale and Its Subdimensions

	N	Minimum	Maximum	Median	IQR
Interest and Desire Factor	165	9	45	33.00	12
Adoption Factor	165	7	35	29.00	8
Belief Factor	165	11	35	27.00	7
Resistance Factor	165	9	30	24.00	5
Overall Attitude	165	60	145	111.00	26

Table 2 indicates that the lowest possible score on the 29-item scale is 29 and the highest possible score is 145. The median General Attitude score was 111 (IQR = 26), which is above the theoretical midpoint of the scale (87), suggesting that the participating middle school students tend to hold generally positive attitudes toward artificial intelligence. When the sub-dimensions were examined, the highest median scores were observed in the Adoption of Artificial Intelligence (Median = 29, IQR = 8) and Resistance to Artificial Intelligence (Median = 24, IQR = 5) sub-dimensions, indicating lower levels of resistance and more positive orientations toward AI after reverse coding. This was followed by the Belief in the Power of Artificial Intelligence sub-dimension (Median = 27, IQR = 7). The Interest and Desire for Artificial Intelligence Learning sub-dimension had the lowest median score (Median = 33, IQR = 12), suggesting relatively lower interest compared to the other dimensions.

3.2. Quantitative Findings

3.2.1. Gender variable

The Mann-Whitney U test was performed to determine whether the scores obtained by students on the AIAS and its sub-dimensions showed a significant difference according to gender. The rank averages for the "Belief" dimension and general attitude, where a significant difference was found, and the test results for all dimensions are presented in Table 3.

Table 3. Mann-Whitney U Results of Attitude Scores by Gender

Factor	Group	N	U	p
Interest and Desire	Male	74	2,851	.057
	Female	91		
Adoption	Male	74	3,350	.955
	Female	91		
Belief	Male	74	2,750	.026*
	Female	91		
Resistance	Male	74	3,006	.159
	Female	91		
Overall Attitude	Male	74	2,798	.062
	Female	91		

*p <.05

The analysis in Table 3 revealed that the scores obtained by students on the "Belief in the Power of Artificial Intelligence" (F3) sub-dimension differed significantly according to gender (p = .026). According to the rank averages in Table 3, male students (Mean Rank = 93.33) believe in the power of artificial intelligence significantly more than female students (Mean Rank = 76.58). No significant difference was found between genders in other subdimensions and in the General Attitude score (p > .05).

3.2.2. Grade level variable

The Kruskal-Wallis H test was performed to determine whether the scores obtained by students on the AIAS and its sub-dimensions showed a significant difference according to their grade level. The results are presented in Table 4.

Table 4. Kruskal-Wallis H Test Results for Attitude Scores According to Grade Level

Score Type	Chi-Square (χ^2)	(df)	p
Interest and Desire	.714	3	.870
Adoption	1,158	3	.763
Belief	7,933	3	.047
Resistance	5,173	3	.160
Overall Attitude	2,240	3	.524

*p <.05

The analysis in Table 4 revealed a statistically significant difference based on grade level only in the "Belief in the Power of Artificial Intelligence" (F3) sub-dimension (p = .047). However, in the Bonferroni-corrected multiple comparison tests (Mann-Whitney U) conducted to determine the source of this difference, no significant difference was found between any pair of class groups (all p values > .0083). There is no significant difference according to class level in the other dimensions and overall attitude (p > .05).

3.2.3. Academic achievement variable

Spearman Correlation analysis was performed to examine the relationship between students' scores on AIAS and its sub-dimensions and their academic achievement. The results are presented in Table 5.

Table 5. Spearman Correlation Results Between Attitude Scores and Academic Achievement

Score Type	Correlation Coefficient (rho)	p
Interest and Desire	.006	.943
Adoption	-.057	.470
Belief	0.046	.554
Resistance	.017	.831
Overall Attitude	-.037	.640

The results in Table 5 show that there is no statistically significant relationship between students' academic achievements and their General Attitude scores toward artificial intelligence or any subscale of the scale (all p values > .05).

3.2.4. Home internet access variable

A Mann-Whitney U test was conducted to determine whether there was a significant difference in the scores students received on the AIAS and its subscales based on whether they had internet access at home. The results are presented in Table 6.

Table 6. Mann-Whitney U Test Results for Attitude Scores According to the Home Internet Access Variable

Score Type	U	Z	p
Interest and Desire	629,00	-.582	.561
Adoption	394,50	-2,212	.027*
Belief	667,00	-.312	.755
Resistance	608,50	-.730	.466
Overall Attitude	553,50	-1,066	.286

*p <.05

According to the analysis results in Table 6, students' scores on the "Adoption of Artificial Intelligence" (F2) sub-dimension differed significantly based on home internet access (p = .027). When rank averages were examined, students without internet access at home had higher scores on this sub-dimension, indicating more positive attitudes toward artificial intelligence after reverse coding. No significant differences were found in the other sub-dimensions or in overall attitude (p > .05).

3.2.5. Mother and father education level variables

The Kruskal-Wallis H test was performed to determine whether the scores obtained by students on the

AIAS and its sub-dimensions showed a significant difference according to their mothers' and fathers' education levels. The results are presented in Table 7.

Table 7. Results of the Kruskal-Wallis H Test for Attitude Scores According to Mother and Father Education Level

Variable	Score Type	Chi-Square (χ²)	(df)	p
Mother	Interest and Desire	1,516	2	.469
	Adoption	.040	2	.980
	Belief	2,458	2	.293
	Resistance	2,679	2	.262
	Overall Attitude	1,108	2	.575
Father	Interest and Desire	1,066	2	.587
	Adoption	1,483	2	.476
	Belief	.594	2	.743
	Resistance	.301	2	.860
	Overall Attitude	.139	2	.933

According to the results in Table 7, no statistically significant difference was found in students' General Attitude scores toward artificial intelligence on any subscale of the scale, based on either mother's or father's education level (all p values > .05).

3.2.6. Artificial intelligence usage experience variable

The Mann-Whitney U test was applied to examine whether the scores obtained by students on the AIAS and its sub-dimensions differed based on whether they had previously used artificial intelligence technologies. The results are summarized in Table 8.

Table 8. Mann-Whitney U Test Results for Attitude Scores Based on Artificial Intelligence Usage Experience

Score Type	Group	U	p	r (effect size)
Interest and Desire	Yes / No	465,00	.200	.06
Adoption	Yes / No	217,50	.007*	.21
Belief	Yes / No	155,00	.000*	.25
Resistance	Yes / No	164,50	.000*	.24
Overall Attitude	Yes / No	136,00	.001*	.26

* The group of students reporting no prior AI usage was relatively small (n = 7); therefore, the related results should be interpreted with caution.

From the analysis of the results of the Mann Whitney U test as indicated in Table 8, statistically significant differences were found within these specific sub-dimensions, namely "Adoption" (p = .007, r = .21), "Belief" (p = .000, r = .25), and "Resistance" (p = .000, r = .24), as well as the attitude score as a whole, based on the experience gained from using artificial intelligence by the students. Conversely, no statistical significant differences were found in relation to the "Interest and Willingness" dimension (p = .200, r = .06). Concerning the specific areas in which statistically significant differences were found, higher mean rank scores were found for those students who had experience with artificial intelligence.

Nevertheless, the unequal number of participants in the two groups compared (with experience: n = 158; without experience: n = 7) is viewed as a fundamental aspect that restricts the reliability and generality of the study. Specifically, the absence of a statistically significant difference in the "Interest and Desire" dimension, combined with the extent of the statistically significant differences recorded in the other dimensions, should be viewed under the influence of the representativeness of the participants who had no prior experience with AI. In short, the results should be viewed from a cautious point of view, not as a basis that proposes absolute conclusions, but as an expression of a preliminary trend that is specific to the study and should be designed under related studies appearing in the literature.

3.2.7. Device type variable

A Kruskal-Wallis H test was conducted to determine whether there was a significant difference in the scores obtained by students on the AIAS and its sub-dimensions according to the type of device they owned. The results are presented in Table 9.

Table 9. Kruskal-Wallis H Test Results for Attitude Scores According to Device Ownership Variable

Score Type	Chi-Square (χ^2)	(df)	p
Interest and Desire	4,194	4	.380
Adoption	1,737	4	.784
Belief	10,737	4	.030*
Resistance	5,957	4	.202
Overall Attitude	5,459	4	.243

According to the results of the Kruskal-Wallis H test in Table 9, it was found that the scores obtained by students on the "Belief in the Power of Artificial Intelligence" (F3) sub-dimension differed at a statistically significant level according to the type of device they owned (p = .030). However, multiple Mann-Whitney U tests with Bonferroni correction were conducted to determine which device groups showed this difference, and no statistically significant differences were found in any pairwise device group comparisons (all p values > .005). No statistically significant differences were found in other dimensions or overall attitude based on device ownership (p> .05).

3.3. Qualitative Findings

This section presents the main themes, categories, and codes related to these categories that emerged from the thematic analysis of the data obtained from the written interviews.

3.3.1. AI as a personal language tutor: student expectations and perceived learning benefits

This theme reflects students' learning-oriented expectations and perceived benefits regarding the use of artificial intelligence in English learning processes. Rather than motivation alone, the categories under this theme illustrate how students associate AI with concrete support for language skill development, personalized and engaging learning experiences, and functional assistance in tasks such as speaking practice, vocabulary learning, writing, and homework. The qualitative findings related to this theme are presented in Table 10.

Table 10. Student Expectations and Perceived Functional Benefits of AI in English Language Acquisition

Theme	Category	Code
Perceptions Regarding the Potential of AI to Transform Language Learning	Opportunities for Speaking and Pronunciation Practice	*Practicing speaking skills with an AI-based tool; receiving assistance with spoken language tasks; reviewing and correcting oral mistakes; practicing the pronunciation of individual words; speaking freely in a non-judgmental environment (e.g., with a robot); request for a pronunciation improvement application.*
	Vocabulary Acquisition and Development	*Learning unfamiliar vocabulary; exploring word meanings and usages; expanding one's lexical knowledge through diverse English terms; request for a vocabulary-focused application; interest in gamified approaches to learning words; learning vocabulary through songs.*

Support for Writing Skills		*Requesting AI-based tools that provide writing corrections; identifying and understanding spelling errors; receiving vocabulary and sentence structure suggestions while writing stories or texts.*
Personalized and Enjoyable Learning		*Using AI as a personal language-learning companion (e.g., like a diary); gamifying learning activities (e.g., through point systems or rankings); engaging in fun, interactive language practice; learning through natural conversation; learning with music; exploring English jokes and riddles; receiving exercises tailored to individual proficiency levels; progressing at one's own pace.*
Homework and Project Support		*Receiving assistance in generating project ideas; guidance in completing homework assignments; support with research activities; help in preparing and organizing presentations.*

Behind the interest of students in AI robots is the expectation of receiving helpful solutions to difficulties encountered when learning English. Particularly, need for practice in speaking and bashfulness here create interest in AI robots. Here is an example given by S2's words:

S2: *"If I had such a robot, it would be very helpful, especially in terms of speaking, and it would interest me."* Similarly, hope to rehearse free from judgment or mistake is also a major source of motivation. S11 brought out the point as follows:

S11: *"A robot with which I could practice speaking most would fascinate me. Because I am shy in speaking to people, but I can speak easily with a robot."*

In addition to speech practice, the desire to improve pronunciation and spelling skills also drives interest in AI technology. S7's response shows such eagerness:

S7: *"Speaking practice, reviewing my mistakes, and practicing spelling and pronunciation of words really excites me."*

The potential to ease word learning as well as make it fun is also an compelling factor for students. Making learning a game is imagined by S5:

S5: *"I would like to practice or learn English in a fun manner. For example, if we called the activities we do as far as verb conjugation is concerned 'levels,' and if we finished doing something and got points based on how many right answers, and if we were not allowed to go to the next level unless we have more than a set number of points and there was a ranking, I think this would be ideal."*

Also, the need for writing skills supporting tools can also be observed. As S13 has said:

S13: *"A program that proof-reads my English texts and corrects my errors would be of great help. It would help me realize where I made the mistakes."*

Moreover, students also highlighted the use of artificial intelligence as a supportive tool for homework and project-related tasks (S6, S17). These comments illustrate that students consider AI as a personal assistant to learn English and guide them step by step. They also define AI as a supportive system that can help them confront their problems in studying English.

3.3.2. Imagining the future classroom: beliefs about aı's transformative potential

The subject here involves the views of students on the potential impact that AI could have on the approaches used for learning languages in the future, the challenges that could be overcome, and how the technology could improve the entire experience of acquisition. The data obtained in this regard is presented in Table 11.

Table 11. Student Beliefs Regarding the Transformative Potential of AI in Future Classrooms

Theme	Category	Code
Perceptions Regarding the Potential of AI to Transform Language Learning	Providing Practicality and Ease of Access	*Addressing the lack of speaking partners; reducing fear of being judged when practicing; enabling quick access to word meanings; eliminating the need to manually search for vocabulary in dictionaries; allowing practice at any time; supporting learning from any location with internet access.*
	Potential for Skill Development	*Supporting writing and speaking improvement; correcting pronunciation errors; enhancing vocabulary acquisition; improving speaking fluency; enabling exposure to various English accents; offering real-time feedback for error correction in writing.*

| | Transforming the Learning Process | *Delivering personalized lesson plans; making learning more engaging and motivating; interacting with students in a human-like manner; adapting learning materials to individual learning styles; reducing teacher workload; integrating gamified elements into learning.* |
| | Increasing Cultural Understanding | *Providing insights into the cultural context of the target language.* |

The learners strongly believe in the tremendous potential of AI for English learning. At the core of this belief is the assumption that AI will play a vital role in solving the problems of practice. It has been noted that AI could have the solution to some common problems such as not having the opportunity to speak with English native speakers or being afraid of making mistakes.

S2: *"I think one of the biggest challenges in learning a language is not being able to use it in our environment, even if we know it... AI will be very effective in this regard; we will practice speaking with it..."*

The reduction in fear of judgment is also seen as a significant advantage of AI. As per S1:

S1: *"when we are talking to artificial intelligence, we don't get that fear of judgment because it's not human."* The potential of AI to perform specific language abilities has also been consistently emphasized. Correction in pronunciation errors and enrichment of vocabulary are among the significant expectations. S8 expressed himself as follows regarding this aspect: S8: *"this artificial intelligence improves our pronunciation and enriches your English vocabulary."*

S3 also mentioned the potential for a general improvement in writing and speaking skills:

S3: *"I think we can solve our problems in writing or speaking..."*

The students believe that artificial intelligence has the ability to influence learning by adapting it to suit each individual. They indicate that artificial intelligence is able to provide one with experiences that fit their needs. The students are supported by S11 when he states that

S11: *"AI will provide us with a customized learning plan. The AI will focus on our areas of weakness and immediately strengthen our areas of strength."* Additionally, the argument is made that it will provide easier and motivating learning experiences for students (S7: *"it makes people more eager to learn languages"*). These arguments demonstrate the students' idea of AI as a tool aimed at facilitating easier and more effective learning experiences.

3.3.3. Between enthusiasm and anxiety: concerns about AI ıntegration in education

This theme covers students' concerns, reservations, and thoughts about possible negative aspects regarding the increased use of AI-supported tools in English classes. The data obtained in this regard is presented in Table 12.

Table 12. Pedagogical and Ethical Concerns Regarding the Integration of AI in Education

Theme	Category	Code
Concerns and Anxieties Regarding the Use of AI in Education	Loss of Human Interaction and Emotional Presence	*Disruption of the teacher–student rapport; absence of humor in communication; inability to explain content with the clarity of a human teacher; lack of emotional understanding; diminished impact of a teacher's unique speaking style; loss of personal connection; fear that lessons may become monotonous; reduced teacher motivation.*
	Negative Impacts on the Learning Process	*Fear of insufficient comprehension; risk of fostering student laziness; increased dependency on technology; potential decline in critical thinking skills; hindrance to the development of social skills.*
	Technical and Accessibility Challenges	*Possibility of technical failures (e.g., internet issues); unequal access to digital tools; variability in students' and teachers' ability to use AI technologies effectively.*
	Security and Ethical Concerns	*Risks related to data privacy; potential for manipulating or deceiving AI systems; concerns about the ineffective or inappropriate use of AI by educators.*

In addition to their positive expectations regarding the integration of AI into English lessons, students also have significant concerns. Chief among these concerns is the weakening of human interaction and emotional bonds. Students are concerned that AI will negatively affect the sincere relationship they have established with their teachers and the classroom atmosphere. S1 expressed this situation as follows:

S1: *"The inclusion of artificial intelligence in classes may disrupt the sincere environment created by teachers. For example, artificial intelligence lacks a sense of humor and similar systems..."*

The idea that the positive impact of the teacher's style of presentation and personal approach on learning will be lost with AI is also widespread. As S8 stated:

S8: *"I don't think this situation would be very pleasant for us because I believe that students would understand better from the teacher's way of speaking and style of speaking than from the teacher's explanation."*

Concerns also include that AI could reduce the effectiveness of the learning process and lead to some negative habits. S3 expressed the fear that AI might not explain as well as a teacher and that comprehension difficulties could arise:

S3: *"I'm worried because artificial intelligence cannot explain the lesson like a teacher, and I won't be able to understand it very well either..."*

Furthermore, risks such as over-reliance on AI leading to laziness (S5: *"...if we don't use it in moderation, it can lead to laziness"*) and causing technology addiction (S7: *"...using technology for everything can lead to addiction to technology..."*) have also been mentioned. Concerns about the potential weakening of one's own thinking skills were also expressed by S20:

S20: *"If we rely too much on artificial intelligence, our own thinking and problem-solving skills may weaken. We may become accustomed to ready-made answers."*

Technical issues, access inequality (S12: *"It may create inequality for students who do not have internet access"*), and data security (S18: *"How secure will our private information be?"*) are other important concerns raised by students. These findings show that students are cautious about AI integration and are aware of the potential disadvantages that technology may bring to education.

3.3.4. Everyday AI practices: how students actually use AI tools

This theme reveals how often and for what purposes students currently use or do not use artificial intelligence tools (translation websites, language applications, chatbots, etc.) while learning English, as well as the reasons behind this. Findings related to this are presented in Table 13.

Table 13. Current AI Adoption Patterns and Practical Usage Habits among EFL Learners

Theme	Category	Code
The Adoption Status of AI Tools in English Learning Practices	Frequent and Varied Use	*Frequent use of AI tools for vocabulary and meaning; heavy reliance on online translation platforms; researching word meanings and taking notes; using AI to construct sentences; employing AI tools for practice; utilizing AI for checking grammar and accuracy in writing; using vocabulary-learning applications; interacting with chatbots (e.g., ChatGPT); using AI for homework assistance and research purposes.*
	Limited and Purpose-Specific Use	*Occasional use limited to checking word meanings; avoiding excessive reliance (e.g., during exams); using translation tools only when dictionaries are unavailable; employing AI exclusively for pronunciation or understanding meanings; using AI tools to comprehend English-language resources.*
	Motivations for Use	*Lack of knowledge of specific vocabulary; absence of English speakers in the family; not having anyone to ask for help; insufficiency of traditional paper dictionaries; slow access to information via conventional tools; perceived speed and convenience of AI tools; curiosity about correct pronunciation; teacher's recommendation; use for completing homework tasks.*

Students' habits of using AI tools while learning English vary significantly. One group of students reported using these tools regularly as part of the learning process. This use is usually made for the immediate need to learn the meanings of unknown words.

S8 explained this situation as follows: *"I use translation websites a lot when doing homework or solving problems because there are many words I don't know the meaning of."*

Similarly, S6 said, *"I use them a lot; I look up the meanings of all the words I don't know and take notes in my book."*

The reasons for this intensive usage include, but are not limited to, the slowness and inadequacy of the paper dictionaries (*"it takes too much time, so I prefer AI tools for this"*-S4) and not having anyone at home to help (*"no one in my family except my sister*

is good at English"*-S2). On the other hand, some students reported using the AI tools more sparingly and for specific purposes. For example, S1 reported using it rarely for the word meaning or spelling, and S5 reported usually preferring the dictionary but resorting to translation when it's not available. These variations may have stemmed from a combination of factors such as students' personal learning preferences, access to technology, teacher guidance, and their confidence in the AI tools.

3.3.5. Developing responsible users: awareness, balance, and peer advice

This theme includes students' general assessments of AI's role in English learning, their awareness of it, and their recommendations on the subject. Findings related to this are presented in Table 14.

Table 14. Student Recommendations and Awareness for Balanced and Reflective AI Engagement

Theme	Category	Code
Student Awareness and Recommendations Regarding AI-Supported Language Learning	Using AI as a Supportive Tool	*Using AI effectively to support language learning; employing it for vocabulary acquisition and speaking practice; learning unfamiliar words; receiving assistance with homework; practicing speaking skills; targeting individual weaknesses through AI tools; learning how to use technology appropriately; making the learning process more enjoyable.*
	Adopting a Balanced and Critical Perspective	*Avoiding overreliance on AI due to its potential for error; limiting excessive use; preferring to learn with human teachers; viewing AI as a supplement rather than a replacement for educators; verifying translations; not depending solely on AI-generated content; maintaining a questioning attitude; avoiding passivity or laziness; using AI in a balanced manner without rejecting or overusing it.)*
	Integrating AI with Other Learning Methods	*Combining AI use with watching TV series, reading books, and playing educational games; incorporating media such as films and music; committing to self-study and independent research; focusing on vocabulary and pronunciation development; maintaining real-life communication with people.*
	Practical Advice and Safety Considerations	*Experimenting with various language learning applications; avoiding the sharing of personal information with untrusted or unreliable platforms.*

The advice students give their peers on AI and English learning shows that they are aware of the potential benefits of technology but have developed a strong awareness of the need to be careful and balanced in its use. Using AI as a tool to support learning is a widely accepted idea.

S7: *"I think they should learn English extensively with artificial intelligence and practice speaking"*, while S9: *"I recommend learning with artificial intelligence, especially when learning vocabulary or repeating speech"* gave detailed suggestions.

Also, S10 tells about the importance of AI: *"AI is important in English; it improves the quality of our speech and teaches us to use technology correctly"*

But this optimistic view is tempered with some significant caveats, and it is repeated often that AI is not to be trusted implicitly.

S3 pointed out the accuracy issue and said, *"artificial intelligence sometimes makes serious mistakes in foreign languages"*

Another important advice is that AI is only an assistant and cannot replace the teacher. As S11 put it, *"Artificial intelligence tools should be considered as an assistant, not a replacement for the teacher"* It was further emphasized that extreme usage should be avoided and a balanced method should be followed.

S8 said, *"I wouldn't recommend using too much artificial intelligence, of course they should use it, but I would recommend learning more with their teachers"* while S24 said that the most important point is *"balanced use."* Important recommendations include that they shall not get lazy due to this (S16: *"Don't get used to laziness"*), and they have to question the information they obtain from artificial intelligence themselves (S15: *"Question the information obtained from artificial intelligence"*).

However, students were also aware of the need to combine AI use with other ways of learning. Traditional practices such as watching TV series/movies and reading books were also suggested (S1, S2, S14), and the need not to forget talking to real people was mentioned: *"they shouldn't neglect talking to real people"* S12. These results demonstrate that students have started developing a mature and reflective view on the role of AI in language learning, understanding both its potential benefits and limitations and risks.

4. Discussion

This paper examined the attitudes towards AI among EFL students in the middle school. The results from the quantitative data revealed a positive attitude (Median = 111) and low resistance towards the integration of AI. This outcome is in agreement with the findings from the works done by Demir and Güraksın (2022) and Şerbetcioğlu (2024), who revealed that the Turkish approach in technology was optimistic. The optimistic nature of the technology approach has also been observed in international research, in which the findings from the research by Glaveanu and Maier (2025) revealed a willingness among university students towards the involvement of AI in all realms of their study, and the findings from the research by Chen, Chen and Lin (2020) that emphasized the significance of the transformative nature of AI in the administrative and teaching aspects related to current learning. A key finding of the present study involves a strong association between prior AI experience and positive attitude, H1. Specifically, students who had prior experience scored significantly higher in "Adoption," "Belief," and "Overall Attitude." This would corroborate TAM, which states that perceived usefulness and ease of use become more solidified when an individual interacts with the technology directly (Venkatesh & Bala, 2008). Some researchers also point out a similar fact: the more AI becomes incorporated into CALL, the more receptive students become due to their growing familiarity with chatbots or automatic writing evaluation.

The results regarding H3 are the first indication of the validity of the conceptual approach proposed in the current work and labeled as the appeal of deprivation. The above results regarding the students who did not have internet access at home support the notion that under certain conditions, the relatively lower availability of certain technologies could increase the overall appeal of AI as a potential key to accessing the broader world of knowledge. A similar notion is also promoted by Kim and Lee (2024), who proposed the idea that students who are socio-culturally at a disadvantage are more oriented towards using AI as a means of balancing power. Clear conclusions regarding the above-mentioned assumptions should be avoided at the moment only due to the relatively low number of the corresponding subgroup of the population. At the moment, the "appeal of deprivation" should be characterized as a working hypothesis rather than a tested theory. In light of the gender dimension (H4), a significant difference in the 'Belief in the Power of AI' factor was found, in which males scored higher. This is in line with earlier research by Pokrivcakova (2023), as well as Kim and Lee (2024), which found gender to influence interest in technologies.

Qualitatively, the students conceived of AI assistance in general as a "solution-oriented tutor for skills such as speaking, writing, etc." Their interest in an AI like Siri for pronunciation guidance follows Haryanto and Ali (2019), while their need for corrective feedback assistance from AI reflects the results of Hou, He and Cuigong (2024) on the role of AI-produced corrective feedback in L2 proficiency. The perceived usefulness of ChatGPT for improving writing skills & critical thinking skills follows the roles AI plays in boosting motivation & performance, per Dal and Tunagür (2025); Song & Song (2023), respectively. Yet this utility is mitigated by the "loss of human interaction" & "teacher rapport." The aforementioned concerns correspond with the study of Zhi and Wang (2024), where Teacher Immediacy (TI) and Teacher-Student Rapport (TSR) continue to serve as the underlying foundations of Willingness to Communicate (WTC). Secondly, the worry about "laziness" and "technology addiction" echoes the uncertainties expressed by teachers in the appraisal of the study by Dişlioğlu et al. (2025); Özer et al. (2023).

5. Conclusion

The empirical findings of the current research offer a most valuable synthesis of the necessary factors for the formulation of students' attitudes toward AI, revealing specific results regarding the proposed hypotheses. More precisely, H1 was supported, as students who had previously dealt with AI expressed more positive attitudes toward AI in three sub-dimensions of the scale and the overall score (p < .05). On the contrary, H2 was not supported, since although the "Belief" dimension was initially differentiated, post-hoc tests did not identify any statistically significant differences between the grade levels (p > .05). Finally, in what concerns the impact of home internet usage (H3) and gender (H4), the hypothe-

ses under study were only partially supported, since statistically significant differences were found in the "Adoption" (p = .027) and "Belief in the Power of AI" dimensions (p = .026), respectively. Lastly, in what concerns RQ1, it should be mentioned that academic and parental education levels were not influential factors in students' attitudes toward AI (p > .05).

The "cautious optimism" apparent in students' responses—a balanced approach between being enthusiastic about AI's positive applications and having an understanding of its risks that comes from greater maturity—is an indication that students are now ready to receive organized education on AI. This ties in with UNESCO's (2024) Competency Framework, as well as recommendations by Miao et al. (2021), which recommend guidelines on how AI literacy education should be included in the Turkish education syllabus, not only highlighting technical education (Kalafat Çat & Huseynova, 2025; Kil et al., 2025) but maintaining its human essence as well.

Finally, there is a need for equitable access to bridge the digital divide, particularly in areas where the "appeal of deprivation" has been most evident. Future research into how these attitudes change as AI usage increasingly becomes part of daily instruction should be longitudinal. Conclusion The integration of AI into EFL learning will only be successful if this informs attitudes of ethical and learner-centered design that complement, rather than replace, the essential human rapport found in the classroom.

Declaration of AI Use

While this work was being prepared, the authors made use of the Gemini AI tool in a bid to smoothen the flow of language as well as the structure of the work.

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