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ATTITUDES OF PRESCHOOL TEACHERS TOWARDS ARTIFICIAL INTELLIGENCE

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ABSTRACT

Due to developments in the field of artificial intelligence, AI-supported education has become increasingly effective in early childhood settings. Studies indicate that the use of artificial intelligence in early childhood education enhances children's learning processes. Therefore, this study aimed to examine preschool teachers' attitudes toward the use of artificial intelligence in education. An explanatory mixed-methods design was used. Quantitative data were collected from 120 preschool teachers, and qualitative data were gathered through interviews with 10 preschool teachers. The results showed that teachers' attitudes toward artificial intelligence did not vary by age or work experience but did differ by gender. Overall, preschool teachers generally supported the use of artificial intelligence in early childhood education. Interestingly, teachers with higher proficiency in using technological devices had more negative attitudes toward AI than those with lower proficiency. The study also found that many teachers believed AI cannot yet be effectively used in preschool education due to a lack of equipment, high costs, insufficient expertise, and concerns about its appropriateness for children's developmental needs. Based on these findings, it is recommended to develop training programs that enhance preschool teachers' self-efficacy in digital literacy and AI use. Additionally, the necessary infrastructure and systems should be provided in preschool environments to support the equitable implementation of AI across all institutions.

Key Words: Preschool, artificial intelligence, teacher attitudes

INTRODUCTION

Artificial intelligence was first introduced in 1956 at a seminar held at Dartmouth College under the leadership of John McCarthy (Coppin, 2004). Since then, scientists have proposed various definitions. Haugeland (1985) defines AI as the effort to transfer human thinking ability to machines or computers. According to Coppin (2004), AI is any system that solves difficult problems by imitating the behavior of the most intelligent being—humans. Another definition describes AI as the modeling of a computer system based on human understanding and intelligence (Konar, 2018). Tektaş et al. (2002) explain AI's purpose as making machines more useful to humans, enabling computers to interpret intelligence, equipping them to imitate human thought, and providing them with the ability to learn. Despite their diversity, these definitions share two common features: "intelligent programming" and "human-like responses." However, defining artificial intelligence remains challenging, especially since natural intelligence itself is not yet fully understood (Arslan, 2020).

Having moved from laboratory environments into homes and personal devices, AI now has the potential to transform education by becoming an integral part of teaching and learning (Viktorivna et al., 2022). Because AI affects both students and teachers, its ultimate impact on educational outcomes remains difficult to predict. As in many areas of our lives, the use of AI in education will bring both benefits and challenges (Reiss, 2021). By leveraging historical and real-time data, AI is already supporting various aspects of the learning process (Chen & Lin, 2024). Although AI applications in primary school education are still in their infancy, they have seen wider adoption in higher-education settings. For example, China's high-school curriculum now includes a 36-hour AI course covering fundamental concepts, history, and algorithm design. Additionally, "Smart Campus" and "Smart Education" initiatives are being deployed across primary, tertiary, and community-learning institutions (Papadakis et al., 2023; Yang, 2019). AI also enables teachers to engage with students anytime, anywhere, using diverse materials, and allows learners to enroll in courses and programs offered around the globe (Viktorivna et al., 2022).

There is an immediate need to transform education and enhance students' skills for in-demand careers such as programming, AI engineering, and information technology (Papadakis et al., 2023). With AI in education, personalized learning experiences and adaptive content can be created for each student, expanding the scope of teaching. This approach allows curricula to be tailored to the needs and interests of each target group. AI can help teachers identify students' learning styles and provide targeted support at points of difficulty (Majid & Lakshmi, 2020; Su & Yang, 2023). Moreover, AI can analyze students' past performance and facilitate goal achievement, encouraging learners to integrate AI applications into their daily study routines (Lavidas et al., 2024). AI tools also enable students with language or other disabilities to access courses customized to their needs (Majid & Lakshmi, 2020). Teachers—whose tasks include monitoring and evaluating academic progress, grading assignments, planning lessons, and preparing materials—can reduce their workload by leveraging AI (Flores-Vivar & García-Peñalvo, 2023). Finally, integrating social media and chatbots into educational processes increases student engagement and saves time. These developments affect teaching methods and learning environments at all levels and are transforming teachers' instructional styles (Tapalova & Zhiyenbayeva, 2022; Thongprasit & Wannapiroon, 2022).

In early childhood, the use of technology and artificial intelligence can reveal children's learning tendencies and deficits. AI systems that identify a child's strengths and weaknesses and recommend appropriate learning strategies enable teachers to make more informed decisions and provide targeted support (Salaam, 2023). Personalized digital texts created with AI allow children to interact with audio and other multimedia features while viewing story illustrations. Applications such as OurStory let children author their own narratives and add voice recordings and drawings, while others (e.g., Nosy Crow Fairytale) provide story templates for completion. AI enhances these digital books by tracking children's interactions and progress and generating new content based on that data (Kucirkova & Mackey, 2020). Basic-level robots—like Kidoboto and Bee-bot—are well suited for preschool game-based activities and help teach fundamental skills (O'Brien, 2020). More advanced platforms, such as LEGO EV3, LEGO SPIKE, and Matatalab, include audio-visual instructions and offer diverse activities that foster 21st-century competencies like collaboration and creativity (Tang et al., 2021). Moreover, AI-powered robots have been shown to support social interaction among young children with autism and Down syndrome (Honghu, Ting, & Gongjin, 2023).

Although the use of technology and AI is encouraged in education (Dağal et al., 2022) because it offers new opportunities to enhance the learning process, it also carries certain risks. Problems such as misleading information and misdirection may arise from the incorrect application of AI (Su & Yang, 2023; Ozturk, 2025). These risks include accepting AI-generated data without critical evaluation, selectively integrating digital tools into the educational process, and accessing inaccurate, outdated, irrelevant, or biased information (Chen & Lin, 2024). Moreover, hackers' manipulation of AI systems for malicious purposes can give rise to negative scenarios and undermine trust in AI technologies (Park et al., 2021).

As in all fields, the effects of artificial intelligence will be felt quickly and deeply in early childhood education (Aravantinos et al., 2024). In countries with strong education systems—such as the United States, England, Finland, and Singapore—AI training and use begin at ages four or five (Ali et al., 2021). Therefore, to avoid falling behind in AI integration, to promote efficient resource use, and to reduce teacher workload (Hashem et al., 2024), efforts should start in early childhood settings in Turkey. According to Lindner and Berges (2020), the influence of teachers' characteristics and attitudes toward AI education has been rarely explored, making it crucial to understand these effects. There is a noticeable lack of studies on the use and function of AI in early childhood education. So that, AI studies in early childhood emerge as a potential area in education. Than, to help preschool teachers adapt and deepen their knowledge, research on the functions, uses, and applications of AI in early childhood should be rapidly expanded. Moreover, AI has the potential to revolutionize teaching and learning by providing individualized, adaptable experiences tailored to children's needs. Consequently, preschool teachers' perspectives on this topic are especially important. The purpose of this study is to determine preschool teachers' attitudes toward artificial intelligence. In line with this purpose, the following research questions were examined:

1. Do preschool teachers' attitudes toward AI differ significantly based on demographic variables such as age, gender, and years of experience?
2. Do preschool teachers' attitudes toward AI differ significantly based on their level of technological competence?
3. What are teachers' views on the use of AI in preschool education?

METHODOLOGY

This study used a mixed research method. Mixed method is the analysis and presentation of data obtained by using quantitative and qualitative research techniques together in a single study. An explanatory design was used in this study from mixed method designs. An explanatory design is the support of data obtained through quantitative research with data collected through qualitative research techniques (Creswell and Plano Clark, 2007). In this study, the views of teachers working in early childhood education on artificial intelligence were determined with a scale and supported with individual interviews.

Participants

The sample for this study comprised 120 preschool teachers employed in independent preschool institutions affiliated with the Ministry of National Education and in kindergarten classes within primary schools during the 2023–2024 academic year. Prior to data collection, approval was obtained from the Van Yüzüncü Yıl University Ethics Committee and the National Education Directorate. Participation was voluntary, and all participants provided informed consent. The quantitative phase involved 120 preschool teachers selected through simple random sampling, a method that ensures each unit has an equal chance of selection and maintains impartiality (Balcı, 2010). The distribution of teachers across demographic variables is presented in Table 1.

Table 1
Demographic variables table

Personal Characteristics	Category	Number (N)	Percentage
Gender	Female	101	%84.2
	Male	19	%15.8
Age	20-25	7	%5.8
	26-30	39	%32.5
	31-35	42	%35
	36-40	19	%15.8
	41-45	9	%7.5
	46 and above	4	%3.3
Education status	Associate degree	16	%13.3
	Undergraduate	78	%65.0
	Post graduate	26	%21.7
Level of use of technological devices	poor	14	%11.7
	Moderate	95	%79.2
	good	11	%9.2
Seniority	1-5 years	37	%30.8
	6-10 years	39	%32.5
	11-15 years	34	%28.3
	16 years and above	10	%8.3

According to Table 1, of the 120 teachers in the study group, 101 are female and 19 are male. In terms of teaching experience, 37 have 1–5 years, 39 have 6–10 years, 34 have 11–15 years, and 10 have 16 or more years. Regarding technological competence, 14 teachers use devices at a poor level, 95 at an average level, and 11 at a good level. As for educational attainment, 16 hold an associate degree, 78 hold a bachelor's degree, and 26 hold a postgraduate degree.

Qualitative data were obtained through semi-structured interviews with 10 preschool teachers. Among these, six have 1–5 years of experience, two have 6–10 years, and two have more than 10 years. Two teachers are aged 20–25, three are 26–30, three are 31–35, and two are 36–45. Three hold a master's degree, and seven hold a bachelor's degree.

Data Collection Tools and Processes

In this study, the "General Attitude Scale Towards Artificial Intelligence" and the "Semi-Structured Interview Form" were used as data collection tools. Detailed explanations about these measurement tools are provided below.

General Attitude Scale Towards Artificial Intelligence

In this study, the "General Attitude Scale Towards Artificial Intelligence" developed by Kaya, Aydin, Schepman, Rodway, Yetişensoy, and Kaya (2022) was used to determine the attitudes of preschool teachers towards Artificial Intelligence. This 5-point Likert-type scale consists of 20 items, 12 of which are in the positive attitude sub-dimension and 8 in the negative attitude sub-dimension. Cronbach's alpha value was used to measure the reliability level of the scale regarding internal consistency, and this value varies between "0" and "1". Since the alpha value is between 0.60 and 0.80, it is highly reliable, and being between 0.80 and 1.00 indicates that it is highly reliable. The Cronbach's alpha coefficient used for the positive sub-dimension of this scale was calculated as 0.89, and the negative attitude sub-dimension as 0.85. When we look at the coefficients of the General Attitude Towards Artificial Intelligence Scale, it was determined that the reliability of the scale due to internal consistency was high.

Semi-structured interview form

The second data collection tool used in the study was the semi-structured interview form developed by the researchers. The relevant literature was reviewed for the development of the semi-structured interview form, and a question pool of 18 questions was created. A draft interview form was prepared by selecting 11 questions from the question pool. The prepared form was created by obtaining the opinions of two relevant preschool education fields and a language expert, and a semi-structured interview form containing 7 questions was created. Some of the questions in the interview form are given below.

- What are the obstacles to the use of artificial intelligence in preschool education?
- What are your suggestions for the effective use of artificial intelligence in preschool education?
- What are the ethical implications of using artificial intelligence in the learning process, particularly with regard to children's safety?
- How can teachers be made aware of artificial intelligence and the use of artificial intelligence in the teaching process?

The interviews with 10 preschool teachers were conducted on a voluntary basis and, with participants' permission, recorded using a digital voice recorder. Each interview lasted approximately 15 to 20 minutes, and the audio recordings were later transcribed electronically.

The necessary precautions were taken to ensure the reliability and validity of the data in this study. To ensure reliability in qualitative research, several measures were implemented: the interview questions were clear and understandable, code consistency was regularly checked,

and the researcher's role was explicitly defined (Miles & Huberman, 1994). To establish external reliability, detailed explanations were provided regarding the methodology, procedures, and participant selection. Additionally, participants' responses were continuously reviewed, and data were enriched with direct quotations to support both internal and external validity. Finally, in accordance with ethical guidelines, participants were anonymized and coded as Ö1, Ö2, etc.

Data Analysis

SPSS program was used in the analysis of the obtained quantitative data. Normality can be examined in three different ways: skewness coefficient, graphic method (Q-Q Plot) and normality test (Büyüköztürk, 2017). In this context, the study data were examined with both skewness-kurtosis values and Kolmogorov Smirnov value. Since the skewness and kurtosis values were between 1.96 and -1.96, it was seen that these measurement data showed normal distribution (Kim, 2013). In addition, it was seen that the homogeneity assumption was met as a result of the Levene Test ($p>.05$). Arithmetic mean and standard deviation values were examined to determine the attitudes of Preschool Teachers towards Artificial Intelligence towards the dimensions of the General Attitude Scale. ANOVA Test was used to determine whether the attitudes of preschool teachers towards artificial intelligence showed significant differences according to the variables of age, seniority, education level and level of using technological devices. In case of a significant difference as a result of this test, Tukey Test was used to determine which groups caused this difference. The significance level ($p<.05$) was accepted in all analyzes made in the study.

Thematic content analysis method was used for qualitative findings. Thematic content analysis is the definition, description and organization of information related to the created themes. In the last stage, this information is reported (Silverman, 2014). In this study, firstly, a thematic framework was created for data analysis in line with the prepared interview questions. Then, data were classified, described and interpreted by creating codes in the process of data analysis. The data were also supported by direct quotations to support the findings and present the teachers' views. To ensure external reliability, detailed explanations about the position of the researcher and the participants were included in the study. The integrity and consistency of the data were reviewed to ensure internal validity, and detailed explanations regarding processes such as preparing the interview form, and collecting and analyzing the data were included to ensure external validity.

RESULTS

Quantitative results

This section includes the findings regarding the attitudes of preschool teachers towards artificial intelligence. The findings are organized in a way that reveals the views of teachers on the sub-dimensions of the scale of attitudes towards artificial intelligence in line with the sub-objectives of the research and how these views change depending on the variables of gender, age, seniority and education status. The findings obtained as a result of the analyses are presented in the form of tables.

Table 2
Descriptive Statistics Regarding the General Attitude Scale of Preschool Teachers Towards Artificial Intelligence

	N	$\bar{X}$	**S**	**min**	**max**	**skewness**	**kurtosis**
Positive attitude	120	3.47	0.83	1.00	5.00	-0.433	0.316
Negative attitude	120	2.93	0.72	1.13	4.75	0.050	0.146
Total points	120	3.26	0.64	1.35	4.70	-0.224	0.188

Descriptive statistics of the sub-dimensions of the general attitude scale of preschool teachers towards artificial intelligence are given in Table 2. According to the table, it is seen that the positive attitudes of preschool teachers towards artificial intelligence ($\bar{x}$= 3.47) are higher than their negative attitudes ($\bar{x}$= 2.93).

Table 3
Comparison of Preschool Teachers' General Attitudes Towards Artificial Intelligence According to Their Gender

Gender	**Gender**	**N**	$\bar{X}$	**SS**	**t**	**p**
Positive attitude	Female	101	3,37	0.83	-3.224	**0.002**
	Male	19	4.02	0.65		
Negative attitude	Female	101	2.91	0.71	0.629	**0.531**
	Male	19	3.03	0.79		
Total point	Female	101	3.19	0.63	-2.764	**0.007**
	Male	19	3.62	0.61		

In Table 3, the attitudes of preschool teachers towards artificial intelligence according to the gender variable were compared with the "independent sample t test". As a result of the analysis, a statistically significant difference was found between the positive attitude and total score averages of the groups according to gender (p>.05). It was determined that the positive attitude score averages of men ($\bar{x}$= 4.02) were higher than the averages of women ($\bar{x}$= 3.37). In other words, it can be said that male teachers have more positive attitudes towards artificial intelligence than female teachers.

Table 4
Comparison of Preschool Teachers' General Attitudes Towards Artificial Intelligence According to Their Seniority

Scale Sub-Dimensions	***Seniority***	***N***	$\bar{X}$	***SS***	***F***	***P***
Positive attitude	1-5 years	37	3.56	0.91	1.320	0.271
	6-10 years	39	3.40	0.84		
	11-15 years	34	3.59	0.65		
	16-20 years	10	3.05	1.00		
Negative attitude	1-5 years	37	3.03	0.80	1.154	0.331
	6-10 years	39	2.78	0.67		
	11-15 years	34	3.04	0.70		

continued

	16 years and above	10	2.80	0.66		
Total	1-5 years	37	3.35	0.73		
	6-10 years	39	3.15	0.57	1.712	0.168
	11-15 years	34	3.37	0.57		
	16years and above	10	2.95	0.74		

In Table 4, the attitudes of preschool teachers towards Artificial Intelligence according to the seniority variable were compared with "one-way analysis of variance (ANOVA)". As a result of the analysis, no statistically significant difference was found between the mean scores of the groups according to seniority (p>.05).

Table 5
Comparison of Preschool Teachers' General Attitudes Towards Artificial Intelligence According to Technological Device Use

Scale Sub-Dimensions	***Use of technological devices***	***N***	$\overline{X}$	***SS***	***F***	***P***	***Significant difference***
Positive attitude	poor	14	3.59	0.80	3.970	0.021	2-3
	mediate	95	3.53	0.77			
	good	11	2.81	1.18			
Negative attitude	poor	14	3.09	0.79	0.418	0.659	
	mediate	95	2.90	0.70			
	good	11	2.96	0.84			
Total	poor	14	3.39	0.57	2.354	0.099	
	mediate	95	3.28	0.60			
	good	11	2.87	098			

In Table 5, the attitudes of preschool teachers towards Artificial Intelligence according to the variable of technological device usage level were compared with “one-way analysis of variance (ANOVA)”. As a result of the analysis, a significant difference was found between the positive attitude score averages according to the variable of technological device usage level (p<.05). In order to determine which averages the difference was between, the “Tukey” test, one of the multiple comparison tests, was applied and it was found that the positive attitudes of teachers who use medium-level technological devices differed significantly from the positive attitudes of teachers who use good-level technological devices. While the average of teachers who use medium-level technological devices is $\bar{x}$= 3.53, the average of teachers who use good-level technological devices is $\bar{x}$= 2.81. Accordingly, teachers’ technological device usage levels can be considered as an effective factor on their positive attitudes towards Artificial Intelligence.

Table 6
ANOVA Results Regarding the Differentiation of Preschool Teachers' Attitudes

Scale Sub-Dimensions	***Age***	***N***	$\overline{X}$	***SS***	***F***	***P***
Positive attitude	20-25	7	3.84	0.88	0.776	0.569
	26-30	39	3.36	0.84		
	31-35	42	3.60	0.81		
	36-40	19	3.38	1.03		
	41-45	9	3.25	0.51		
	46 and above	4	3.56	0.48		
Negative attitude	20-25	7	3.21	0.57	1.185	0.321
	26-30	39	2.98	0.67		
	31-35	42	2.75	0.73		
	36-40	19	2.96	0.92		
	41-45	9	3.18	0.53		
	46 and above	4	3.28	0.48		
Total	20-25	7	3.59	0.46	0.492	0.781
	26-30	39	3.21	0.65		
	31-35	42	3.26	0.63		
	36-40	19	3.21	0.88		
	41-45	9	3.22	0.34		
	46 and above	4	3.45	0.19		

In Table 6, the attitudes of preschool teachers towards Artificial Intelligence according to the age variable are compared with "one-way analysis of variance (ANOVA)". As a result of the analysis, no statistically significant difference was found between the mean scores of the groups according to age (p>.05).

Table 7
Tablo of thoughts of teachers about the use of artificial intelligence in the education process

Scale Sub-Dimensions	**AI in education**	**N**	$\overline{X}$	**SS**	**t**	**p**
Positive attitude	Yes	101	3,68	0.67	7.43	**0.00**
	No	19	2.39	0.79		
Negative attitude	Yes	101	2.95	0.72	0.529	**0.598**
	No	19	2.85	0.77		
Total point	Yes	101	3.39	0.55	5.630	**0.00**
	No	19	2.57	0.68		

In Table 7, the opinions of preschool teachers regarding the use of artificial intelligence in the education process are compared with the “independent sample t test”. According to the analysis result, a statistically significant difference was found between the mean positive attitude scores of the groups (p<.05). It was determined that the mean of teachers who think that artificial intelligence should be used in preschool education ($\bar{x}$= 3.68) is higher than the mean of teachers who think that it should not be used ($\bar{x}$= 2.39).

Qualitative Results

This section includes the findings obtained by content analysis of the data obtained as a result of semi-structured interviews with 10 preschool teachers. In line with the obtained data, it was examined under four themes as "Positive views on Artificial Intelligence", "Negative views on Artificial Intelligence", "Obstacles to the use of Artificial Intelligence in education" and "Suggestions for the use of Artificial Intelligence in preschool education".

Positive Views on Artificial Intelligence

The question "What are the advantages of using Artificial Intelligence in preschool education in terms of children, teachers, classroom management, and schools?" was posed to the teachers. Four teachers stated that artificial intelligence would have a positive impact on children due to its attention-grabbing and engaging nature. Five teachers noted that it would offer practicality by helping children develop their talents and skills. One teacher emphasized that artificial intelligence would support children in adapting to the era they live in. Additionally, many teachers stated that artificial intelligence positively influences cognitive and language development, and that it could also enhance motor skills if used appropriately.

T3 *"When Artificial Intelligence is used in preschool education, the child can take a more active role since he/she is not only in the user side but also in the producer side. It broadens the child's horizons, teaches different languages and increases the quality of education."*

T4 *"Artificial Intelligence can enable teachers to respond to the needs of today's children. Thanks to Artificial Intelligence, teachers can get to know different teaching techniques and provide better education to children. I also think that Artificial Intelligence can be advantageous in terms of teachers' self-development. If teachers can use Artificial Intelligence correctly, they can save time. They can eliminate unwanted situations and behaviors with Artificial Intelligence."*

T6 *"Active use of Artificial Intelligence in educational institutions shows that the institution is open to new developments and up-to-date. This can make the school more preferred."*

T1 *"It determines the individual learning needs of students and creates personalized learning plans. It increases the teacher's guidance skills by discovering the strengths and weaknesses of students.*

T10 *"...its application is also important for children's development. Early education prepares the child better for the future. I think it is important for children to get to know Artificial Intelligence at an early age in order to adapt to the developing and changing world."*

On the other hand, two teachers emphasized that they support the use of artificial intelligence in education if the necessary conditions for artificial intelligence are provided.

T5 said, *"I have no concerns, I support its use. If it is used for its intended purpose, the results will be positive."*

Similarly, *T10 said, "...I have no concerns. If the necessary training is given to teachers and equipment is provided, it will be implemented very well."*

Negative Views Towards Artificial Intelligence

The question "Do you think there are disadvantages to using Artificial Intelligence in preschool education in terms of children, teachers, classroom management, and schools?" was posed to the teachers. Eight teachers stated that artificial intelligence could negatively affect children's social-emotional skills. Two teachers noted that it might hinder the development of children's large muscles, while four teachers believed it could negatively impact both large and small muscle development. Some of the teachers' views on these concerns are presented below.

"I can say that Artificial Intelligence has the most negative impact on children's social-emotional areas. You can learn through Artificial Intelligence but you can't be friends, you can talk but you can't love. It affects motor development both positively and negatively. For example; while Artificial Intelligence does very well for children with speech, walking and movement problems, it can cause children without disabilities to mostly remain inactive. Over time, this situation can weaken motor skills that are rarely used." T8

"As Artificial Intelligence accustoms children to the ready, it can also dull teachers' skills. Since material support will put economic pressure on schools, the necessary equipment may not be provided." T3

"It can make children uncommunicative. It can prevent them from acquiring some social values. They will directly acquire the skills offered by a system. It can weaken the communication bond between the teacher and the child. It may not meet the children's need for movement. This can cause children to get bored. If technical problems are not resolved in terms of the school, it can cause deficiencies in the education process." T9

"It can negatively affect children's social skills because it causes a decrease in interpersonal communication. Since it focuses more on individuality, values such as sharing and helping children cannot develop. This situation can increase social problems." T2

"It can make classroom management difficult in crowded classes. In addition, since Artificial Intelligence cannot reach every child at the same level, it can increase inequality of opportunity among children." T5

"Artificial Intelligence can cause incorrect or unwanted learning in children. It also makes the teacher passive." T7

In addition, two teachers stated that excessive use of AI applications could lead to addiction, while some teachers noted that negative situations—such as the loss of teacher authority and children being exposed to age-inappropriate content due to a lack of adult supervision—could occur. Five teachers expressed concerns that children's photographs, voices, images, and personal information could be misused by malicious individuals. For example, T3 and T4 stated the following, respectively:

"...if digital security is not provided, there is a possibility that children's personal information could be obtained by unwanted people." (T3)

"I would like to give an example of a situation that I came across and that scared me in particular. In the artificial intelligence studies conducted, the voices and images of some celebrities were copied one-to-one. I think this is a dangerous situation. Such realistic studies could threaten children's safety. Or, taking children's voices and images from their social media accounts and adapting them to different programs has ethically dangerous consequences." (T4)

Obstacles to the Use of Artificial Intelligence in Education

The question "What are the obstacles to the use of Artificial Intelligence in education?" was directed to the teachers. Two teachers stated that their economic situation could be an obstacle, four cited the lack of equipment in schools, and three mentioned that teachers' lack of sufficient knowledge could hinder implementation. Additionally, two teachers stated that children are too young and that artificial intelligence may not be suitable for their developmental characteristics. Some of the teachers' opinions regarding these views are given below.

"The lack of necessary equipment in schools and the fact that teachers do not have the necessary knowledge prevent the use of Artificial Intelligence in education." T10

"In this educational importance, the fact that academic concerns are a little more in the background may be an obstacle for artificial intelligence. It may be seen as unnecessary by the adults around the child. In addition, if we consider it from our country's perspective, the fact that the technological equipment required for the use of Artificial Intelligence is not yet supported in preschool level educational institutions as much as in other levels is also an obstacle." T4

"The biggest obstacle is the age of the children. The fact that children are exposed to the tools that Artificial Intelligence offers us for more than 30 minutes at this age is the biggest obstacle." T8

"The physical conditions of schools and classrooms are not suitable for the use of artificial intelligence. If the conditions are not improved, it will not be useful in preschool. It will be more difficult to use it in preschool because children need someone because of their age range. They need someone's guidance." T9

"The teacher should have control over classroom management. Preschool classrooms are not environments where artificial intelligence can be used alone because emotional problems are among the problems that may arise in the classroom environment and such situations should be solved through human relations." T4

Recommendations for the Use of Artificial Intelligence in Preschool Education

All teachers stated that in-service training should be provided for teachers on the use of artificial intelligence programs and applications, and that all schools and classrooms should be equipped with the necessary hardware and technological infrastructure. Some opinions in this regard are presented below:

"In-service training can be provided to teachers by experts in the field on the benefits and harms of using artificial intelligence. Seminars, conferences and more active studies can be conducted." T7

"First of all, teachers should be provided with quality training in areas such as cybersecurity, robotic coding, and artificial intelligence. Ministries and local governments should cooperate so that both the supervision and quality of the training can be adequate. In addition, teachers should have sufficient knowledge about artificial intelligence programs used abroad and domestically. The programs to be used should be under state control. Families should be included in the artificial intelligence studies to be used. There should be a certain time and place restriction in artificial intelligence studies." T3 "There can be training and conferences. Participation in technology fairs can be provided. Materials such as Microbit can be given to teachers free of charge." T4

DISCUSSION AND IMPLICATIONS

As a result of the research, it was revealed that preschool teachers' attitudes towards AI did not differ according to their age and experience. However, a significant difference was found based on the variables of gender and level of technological device use. Male teachers have more positive attitudes than female teachers. On the other hand, in the study conducted by Jatileni et al. (2023), it was concluded that female teachers are more interested in AI than male teachers. It was also revealed that preschool teachers generally support the use of AI in preschool education. Teachers play a vital role in facilitating student interactions with AI, guiding and evaluating their use of technology in meaningful and creative ways (Aravantinos et al., 2024). Therefore, it is important for preschool teachers to have a positive attitude towards AI. Another finding was that preschool teachers with high skills in using technological devices have more negative attitudes towards AI than those with lower levels of technological proficiency. This may be due to the unique pedagogical and developmental needs of early childhood education, as nature-based schooling has gained popularity for fostering children's connection with nature. However, Lim (2023) found a positive correlation between digital literacy skills and attitudes toward education involving AI.

As another result, teachers stated that AI will contribute to children's cognitive and language development. AI applications offer games, readings, educational tools, and digital platforms that are tailored to children's needs, learning styles, abilities, and performance patterns through the algorithms they use (Chen & Lin, 2024). This contributes to the development of children's cognitive and language skills. Similarly, teachers who participated in the study conducted by Lin et al. (2022) also expressed the opinion that the use of AI will positively affect reasoning skills. Moreover, integrating AI into learning environments will promote student success, meet children's diverse learning needs (Uğraş, Uğraş, Papadakis & Kalogiannakis, 2024), and support teachers' instructional practices to enhance the quality of education (Aravantinos et al., 2024). However, in this research, teachers stated that AI will not positively impact children's social-emotional development. A teacher's statement—"*You can get information through AI, but you cannot be friends; you can talk, but you cannot love*"—indicates that children's need for love, affection, and emotional sharing in the preschool learning environment cannot be fulfilled by AI. It has also been stated that AI may prevent children from interacting with individuals around them, reduce interpersonal communication in the learning process, and hinder the acquisition of certain social values (Yang, 2023). Since empathy and emotional communication play a crucial role in education, the presence of the human element in the teacher-student relationship is essential. For this reason, ethical guidelines should be followed when developing and using AI, and human values should not be compromised (Flores-Vivar & García-Peñalvo, 2023). In addition, Salaam (2023) stated that although AI offers many conveniences and diverse opportunities in education, if children become overly dependent on

technology, it may negatively affect their empathy, creativity, critical thinking, and social skills in early childhood.

Preschool teachers have positive views on digital technology (Bay, 2022), and they stated that activities and studies carried out with AI and digital technology will be attention-grabbing and interesting, and will enhance children's motivation, talents, and skills (Özer-Akkaya & Çam Aktaş, 2023). However, there are concerns that AI-based learning may lead to undesirable outcomes, and that teachers' talents and skills could be dulled due to a more passive role. Adaptation to changes in various professions due to AI, and the emergence of new professional groups (Kasneci et al., 2023), has increased concerns about this technology. This concern is similar to the anxiety experienced when computers first became a significant part of our lives (Beckers & Schmidt, 2001; Wang & Wang, 2022). As AI systems develop rapidly alongside computers, it is predicted that AI may replace humans in roles requiring intelligence and physical effort, and people will need to continuously improve themselves to adapt to this new system. Therefore, some teachers believe they may become passive with the increasing use of AI in education. One teacher expressed concerns about equal opportunity with the statement: "*Since AI cannot reach every child at the same level, it may increase inequality of opportunity among children.*" Similarly, Kasneci et al. (2023) noted that AI could contribute to inequality in educational opportunities. While AI aims to provide inclusive and equitable learning for all children, those living in regions with insufficient access to technology may be left behind. According to Uğraş, Uğraş, Papadakis, and Kalogiannakis (2024), accessibility to technology remains a major issue in some areas. Additionally, digital security concerns were raised. Yang (2019) stated that because AI stores individuals' data, there are risks of data misuse and breaches, including unauthorized sharing with third parties. In today's context—where even developed countries are debating data security—this concern remains a significant and valid point (Yang, 2023).

CONCLUSION

This study reveals that preschool teachers hold differing attitudes toward integrating artificial intelligence (AI) in early childhood education. While many educators acknowledge the potential benefits of AI—such as contributing to children's cognitive and language development, promoting student success, and addressing diverse learning needs—there is also a considerable degree of uncertainty and concern regarding its impact on children's social-emotional development. These findings highlight a clear need for support and training to help preschool teachers understand and effectively integrate AI tools into early childhood education environments.

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CONFLICT OF INTEREST

The authors declares that there are no conflicts of interest regarding the publication of this study.

AUTHOR CONTRIBUTIONS

The authors were responsible for the conception and design of the study, data collection, data analysis, interpretation of the findings, and preparation of the manuscript.

DECLARATION OF GENERATIVE AI USE

No generative artificial intelligence (AI) tools were used in the design, data collection, analysis, interpretation of the findings, or writing of this manuscript.

DATA AVALABILITY STATEMENT

The data that support the findings of this study are available from the author upon reasonable request.

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