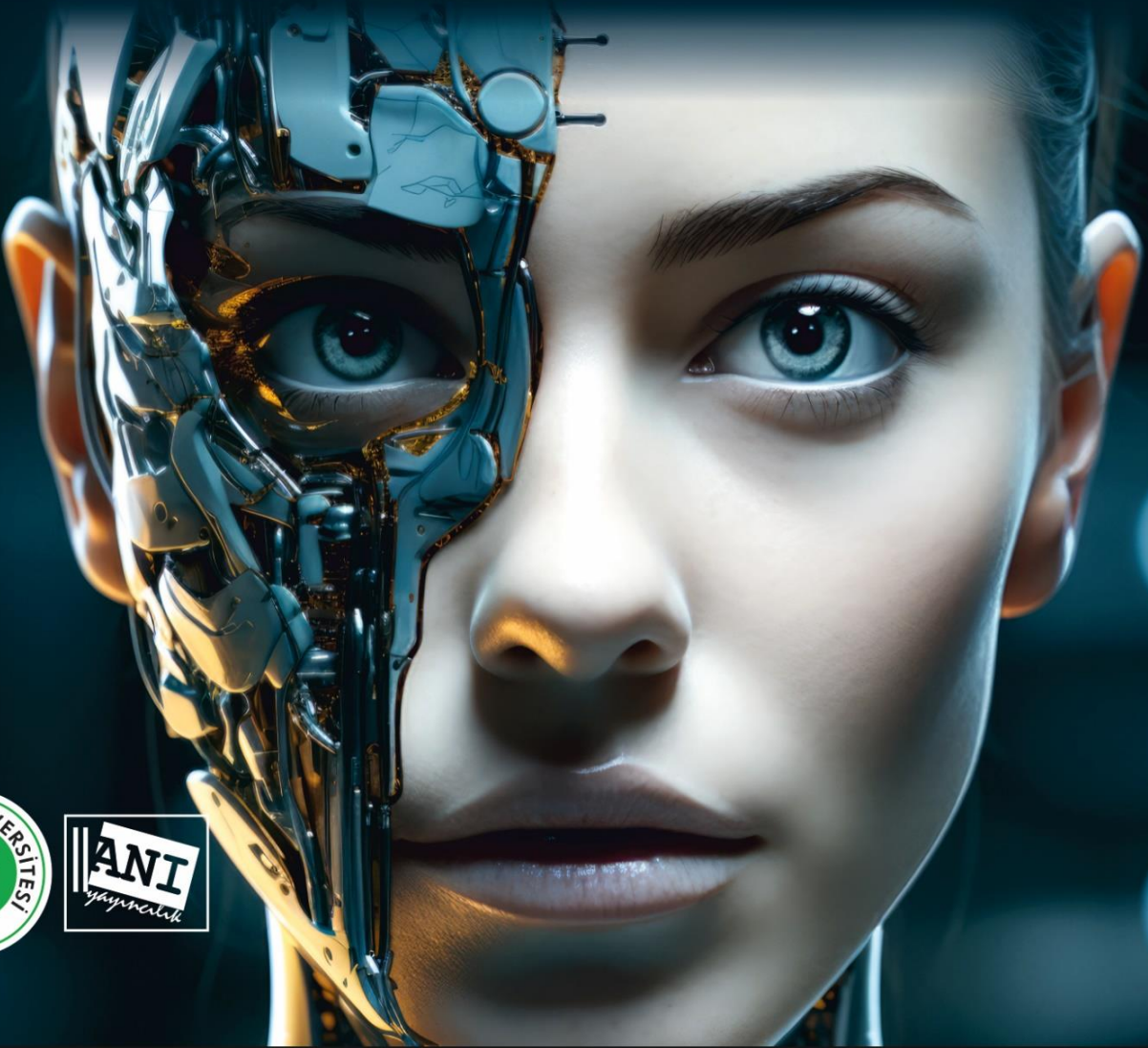# INTERNATIONAL EJER CONGRESS

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Main Theme

"Designing the Future: Changing Paradigms and Transhumanism with Artificial Intelligence in Education"

Sub-Themes

- Academic freedom, autonomy, and social responsibility in education
- Artificial intelligence and educational applications
- Augmented reality applications
- Barriers to learning
- Blended learning
- Computer-assisted measurement and evaluation
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This book has been compiled with contributions from 61 authors representing 35 different universities in Turkiye, the United States, and Iran, as well as Turkiye's Ministry of National Education. Among the contributors, there are 51 authors from 31 universities 6 authors from education institutions in Turkey, 3 authors from 2 universities in the United States, and 1 author from a university in Iran.

CONTENTS

Preservice Preschool Teachers' Attitudes Toward Artificial Intelligence and Their Views on the Use of Artificial Intelligence in Education

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Abstract

The current study was conducted to determine the attitudes of preservice preschool teachers toward artificial intelligence and to identify their views on AI and its application in education. This study was conducted using a sequential mixed methods design. Initially, the attitudes of 145 preservice preschool teachers toward artificial intelligence were determined using the General Attitude Toward Artificial Intelligence Scale. After evaluating the results according to their educational levels, focus group interviews were conducted with at least one participant from each level, including the five highest-scoring and five lowest-scoring individuals, to ascertain their views on AI and its use in early childhood education. At the conclusion of the study, the overall average score of the preservice teachers was determined to be 66.71, which is slightly above the general average. When examined by educational level, it was found that the group with the highest average score was the seniors, while the group with the lowest average score was the freshmen. Participants who scored high on the scale suggested that AI can be beneficial in various areas, including finding activity ideas, preparing and accessing educational materials, attaining otherwise inaccessible products and facilities, asking the right questions in education, and employing observation and other evaluation methods. Conversely, low-score participants indicated that AI could be used primarily for finding activity ideas, accessing educational materials, and parent education. It was found that the responses of the high-scoring participants were more diverse, and those with low scores had limited knowledge of AI.

Introduction

Artificial intelligence typically refers to technology that enables machines to think and process information similarly to humans (Vartiainen et al., 2020). Essentially, it allows machines to recognize, think, perform tasks, and solve problems in a manner akin to human beings (Denning & Tedre, 2019). AI technologies, prominent in areas such as smart home appliances, autonomous vehicles, and smartphones, have become indispensable in our daily lives. Due to advancing technology, AI is now integrated into all aspects of life. The study of artificial intelligence dates back to the 1940s (Denning & Tedre, 2019). Until today, it can be said that the applications developed for teachers to utilize artificial intelligence technologies are mainly those that can be implemented through computers. In educational contexts, AI can assist teachers in predicting students' learning status and performance, recommending learning resources, and automating assessments to enhance students' learning experiences through intelligent agent systems, chatbots, and recommendation systems (Liang et al., 2021; Mousavinasab et al., 2021; Su et al., 2022; Zheng et al., 2021). However, these methods are not yet sufficient to claim that artificial intelligence is actively used in education (Timms, 2016).

Preschool education is a stage where children learn through hands-on experiences, and where the positive aspects of technology can be effectively utilized (MoNE, 2024). While some may believe that early childhood is too early for the exploration and understanding of AI (Su et al., 2022), studies have demonstrated its positive effects (e.g., Lin et al., 2020; Tseng et al., 2021; Williams et al., 2019). In early childhood education, AI-powered toys (e.g., PopBots, Quickdraw) are designed to provide students with playful learning experiences, facilitating interaction with robots and kits while developing AI literacy (Williams, 2018; Williams et al., 2019). Additionally, teachers can leverage artificial intelligence to prepare educational materials, design interactive educational processes, and organize assessment findings. Understanding the attitudes of future teachers towards this technology, which offers a wide range of possibilities, and gathering their opinions on its integration into education is crucial for adapting to contemporary needs and enhancing the quality of education.

The study of artificial intelligence (AI) by humans dates back to the 1940s (Denning & Tedre, 2019). However, studies conducted with in-service and preservice preschool teachers are quite limited (e.g. Lim, 2024; Mart & Kaya, 2024; Su, 2024). In the study by Mart and Kaya (2024) with in-service preschool teachers, it was found that older participants had more negative attitudes toward artificial intelligence. This negativity was attributed to their limited knowledge of AI, fears about the future, and professional concerns, leading them to reject the use of artificial intelligence. In contrast to the age comparison, it was found that students in higher grades approached artificial intelligence more positively which was attributed to the benefits of speed and easy access

to information, as well as the advantages it provides in the academic research process. In line with the aforementioned reasons, answers to the following questions are sought with the current study:

- What are the attitudes of preservice preschool teachers towards artificial intelligence?
- What are the opinions of preservice preschool teachers about the utilization of artificial intelligence in education?
- For what purposes do preservice preschool teachers plan to utilize artificial intelligence in education?

Method

Research Design

In this study, a sequential mixed design, one of the research methods, was used. This study uses a sequential mixed method, driven by the need to explain and develop the initial results (Creswell & Plano Clark, 2018). After determining the general attitude with quantitative data, in-depth information was obtained with qualitative data.

Participants

The study group consisted of 145 undergraduate students enrolled in an early childhood education program at a state university in the Marmara region of Türkiye. Among the participants, 27% (n=40) were freshmen, 26.2% (n=38) were sophomores, 24.1% (n=35) were juniors, and 22.1% (n=32) were seniors. Additionally, 86.2% of the students expressed a desire to pursue their profession in the future, and 86.9% had not received any training on the use of artificial intelligence in education.

Following the collection of quantitative data, 10 participants were selected for two separate focus group interviews, ensuring that each group included at least one participant from each grade level. One focus group interview included the five participants with the lowest scores, while the other involved the five preservice teachers with the highest scores. Convenient sampling was employed for the quantitative phase of the study, and outlier sampling was utilized for the qualitative phase.

Data Collection Tools and Process

In the study, the General Attitude Toward Artificial Intelligence Scale, adapted to Turkish by Kaya and colleagues (2022), and an interview form consisting of open-ended questions developed by the researcher was utilized.

The informed consent form, demographic information form, and the General Attitude Towards Artificial Intelligence Scale (Kaya et al., 2022) were distributed to the preservice teachers via online platforms. Based on the scale results, 10 participants were selected, comprising five preservice teachers with the lowest scores and five with the highest scores, who were then contacted via email. Focus group interviews were conducted with those who volunteered. Data were collected anonymously, with high-scoring participants coded with the letter H and low-scoring participants coded with the letter L. Each interview session, involving five participants per group, lasted approximately 30 minutes.

Data Analysis

Quantitative data were analyzed using IBM SPSS Statistics 24 software. Descriptive analysis was employed to evaluate attitude scores, while ANOVA was used to determine the differences in total scores based on grade levels. For the analysis of qualitative data, a descriptive analysis method was applied. In descriptive analysis, data are systematically and clearly described, explained, and interpreted, taking into account cause-and-effect relationships (Yıldırım & Şimşek, 2021)

Findings

Findings on Preservice Preschool Teachers' Attitudes Toward Artificial Intelligence

In order to examine the reflections of preservice preschool teachers' attitudes toward artificial intelligence on education, their scores from "The General Attitude Toward Artificial Intelligence Scale" are considered. Descriptive data regarding the attitudes of preservice teachers at different grade levels of education are presented in Table 1.

Table 1

Data on the Scores of the Participants from "The General Attitude Toward Artificial Intelligence Scale"

Grade Level	n	Mean	Std. Deviation	Std. Error	Min.	Max.
Freshman	40	62.85	8.59	1.36	45.00	77.00
Sophomore	38	67.24	8.32	1.35	49.00	87.00
Junior	35	66.91	7.13	1.20	48.00	77.00
Senior	32	70.72	8.76	1.55	51.00	96.00
Total	145	66.72	8.61	.719	45.00	96.00

As shown in Table 1, the average score of preservice preschool teachers was determined to be 66.71, which is slightly above the overall average. Additionally, the average scores are 62.85 for freshmen, 67.24 for sophomores, 66.91 for juniors, and 70.72 for seniors. This indicates that the freshman group had the lowest average score, while the senior group had the highest average score among these groups.

According to the grade level, the skewness value of the scores was found to be -.057, and the kurtosis value was found to be .625. The results of the analysis of differences between groups are presented in Table 2.

Table 2

ANOVA Results on the Scores of the Participants from the Whole "The General Attitude Toward Artificial Intelligence Scale" by Variable of Grade Level

Grade Level		Mean Difference	Std. Error	p
Freshman	Sophomore	-4.39	1.86	.12
	Junior	-4.06	1.90	.21
	Senior	-7.87*	1.95	.001
Sophomore	Freshman	4.39	1.86	.12
	Junior	.32	1.93	1.00
	Senior	-3.49	1.97	.48
Junior	Freshman	4.06	1.9	.21
	Sophomore	-.32	1.93	1.00
	Senior	-3.80	2.01	.36
Senior	Freshman	7.87*	1.95	.001
	Sophomore	3.48	1.97	.48
	Junior	3.80	2.01	.36

According to the ANOVA results, a statistically significant difference (p=,001) was found between the total scores of freshmen and senior students on "The General Attitude Toward Artificial Intelligence Scale." This difference favors the senior students. Besides, no significant difference was observed among the other groups.

Findings on Preservice Preschool Teachers' Views on Artificial Intelligence

During the focus group discussions, participants were initially asked about their views on artificial intelligence. The responses from participants with high attitudes toward artificial intelligence predominantly highlighted the positive aspects and personal benefits of AI usage:

My views on artificial intelligence are a bit more... I would say in terms of providing convenience to people in terms of technology, in terms of accessing information faster. (H1-Junior)

I use artificial intelligence applications, for example, when looking for an activity, and I think it is positive. (H2-Senior)

When we write an article or something, we think in one way. But with artificial intelligence, we learn different ways of thinking. We can use it as an aid because it reminds us of things we have forgotten. (H3-Freshman)

Thanks to artificial intelligence, instead of searching through many sources, we can get a single answer from the sources. I think we can get a single answer from there and verify its accuracy instead of searching from many sources. (H4-Sophomore)

According to the excerpts provided from different grade levels, preservice preschool teachers with high attitude scores toward artificial intelligence find it favorable due to its features such as quick access to information, providing ideas for educational activities, presenting expressions from various perspectives, and offering concise responses derived from multiple sources.

The focus group interviews with preservice preschool teachers who received low scores on the scale revealed that participants tended to be more skeptical and/or hesitant about artificial intelligence and its usage:

Artificial intelligence is advancing very quickly, but at the same time, it scares me..... Let's stay more in touch with nature. But I'm a bit hesitant about that, to be honest (L1-Senior)

As we are in the age of technology, some information may be lacking for teachers. I think we can supplement this information with artificial intelligence.......Since I do not know much about artificial intelligence, I can only share my current views. (L2-Sophomore)

I believe artificial intelligence should be in our lives, but it should not dominate completely. I mean, the more it develops, the less need there will be for human labor. (L3-Junior)

I think it will make our lives easier if we use it consciously. (L5-Freshman)

As indicated in the excerpts, participants expressed concerns regarding the rapid advancement of artificial intelligence, the potential reduction in the necessity for human labor, and the responsible use of AI. Moreover, one participant (L2) noted having limited knowledge of the subject, which contributed to a lack of substantial commentary.

Findings on Preservice Preschool Teachers' Views on the Use of Artificial Intelligence in Education

After determining the participants' views on artificial intelligence, their evaluations regarding the use of AI in education were gathered through focus group interviews. Some excerpts from preservice teachers with high attitude scores are as follows:

Both in terms of activities and materials. For example, we are thinking of making a material. I think we can benefit by asking how to prepare it. (H2- Senior)

It is also important to be able to ask the right questions to children. In other words, we can ask questions that are more

suitable for children by simplifying them, rather than asking questions as if we were talking to adults (H3- Freshman)

With artificial intelligence, we can access things we cannot reach….We don't play some games in Turkish culture or from the world, but maybe a different game… a game played in a different country, can be presented to us (H4- Sophomore)

f AI has an observation feature, it can identify aspects that the teacher may not notice. Since we monitor students through observation in preschool, AI can be active in areas that the teacher might miss.(H5- Senior)

After the activity, we can enter observation notes to find out whether the outcome was achieved or not. (H2- Senior)

As evidenced in the excerpts, participants with high attitude scores indicated that artificial intelligence could be effectively utilized in various domains, such as the preparation of educational materials and activity planning, formulation of meaningful questions for children, access to rare content like traditional games from diverse cultures, and in the processes of observation and evaluation.

Some evaluations from participants with low attitude scores and skeptical or hesitant views regarding the use of artificial intelligence in education are as follows:

I make very little use of it. I approach it with prejudice because I am far from technology and I think I cannot do it. But if it's something I can do or if it's not something more openly applied, I use it. I have teaching practice these days. I try not to go to technology as much as possible. More nature and garden. (L1- Senior)

Actually, I am not normally in favor of using it much -but I do use it- so that children are not more dependent on technology. (L2- Sophomore)

I am also in favor of using it when necessary.... But I am more in favor of children discovering and researching. I am in favor of learning by doing and experiencing…. In some areas, we have limited opportunities. I think artificial intelligence can be used in those activities (L3- Junior)

Because children are already born with technology, there is no possibility of not learning it (AI). Therefore, I think it should be learned at school at a minimum level or how it should be used. I don't prefer it much either, to be honest. (L4- Freshman)

Participants with low scores exhibit an avoidant attitude toward artificial intelligence. They emphasize the importance of experiential learning in preschool education and argue that AI should be utilized only when necessary. In this context, their responses to the question of when and how artificial intelligence could be used are as follows:

I can use AI for planning the educational processes… During education, we can use visual or interactive things, but there are different methods. I can also use it for evaluation after the education. When a survey is conducted or when I draw a conclusion by analyzing the scales on the computer, I can use artificial intelligence there. (L1-Senior)

I thought that artificial intelligence could be good in terms of educating the family in terms of literacy, computer use or using technology. (L2- Sophomore)

During the implementation, I used the possibilities of artificial intelligence such as animations, pictures, visual elements… There are evaluation scales, you know, evaluation rubrics for children, I can benefit from them through tablets. (L3- Junior)

I can get inspiration from there for arts and crafts or I can find nature activities or something like that…Math activities can also be supported with visuals, and videos. Art activities are the same. (L5-Freshman)

Participants indicated that artificial intelligence could be utilized in the educational process for accessing activity ideas and materials, family education, visual/audiovisual or interactive media products, and administering surveys, rubrics or scales for evaluation.

Discussion, Conclusion and Recommendations

The current study was conducted to examine the attitudes and views of preservice preschool teachers toward artificial intelligence, as well as their perspectives on the use of AI in education. The research findings indicate that participants' attitudes were slightly above average, with a significant difference favoring senior participants over freshmen. This finding was found to be consistent with the results of the study conducted by Mart and Kaya (2024). The effective use of AI-based tools is a crucial factor influencing the contribution of these technologies to student success (Özer et al., 2023). Building on this premise, this difference can be explained by the senior participants' prior coursework in instructional technology, their use of technology as needed throughout their education, and the technological literacy they have acquired through personal efforts.

In the focus group interviews, it was determined that preservice teachers who scored high on the scale had a positive view of artificial intelligence, appreciating its features such as fast and easy access to information and its ability to facilitate learning and decision-making processes as in the findings obtained from Mart and Kaya's study (2024). Similarly, in another study, preschool teachers expressed their positive views on artificial intelligence by describing it with metaphors such as 'possibility for play and experience,' 'future essentials,' 'innovation and change,' 'convenience,' and 'assistant teacher.' (Lim, 2024, p.9). Conversely, those who scored low on the scale expressed reservations due to concerns about the potential for unconscious or misuse of artificial intelligence and its potential to reduce the need for human labor. In contrast, a study conducted by Çam et al. (2021) highlighted that most preservice teachers believed artificial intelligence technologies would significantly reduce their workloads.

When asked how artificial intelligence can be used in preschool education, it was observed that the answers of the participants with high scores were more diverse than the answers of those with low scores. For example, participants who scored high on the scale planned to use artificial intelligence in preschool education in finding activity ideas, preparing and accessing educational materials, attaining rare contents and products, asking the right questions in education, observation, and other evaluation methods; while

participants with low scores planned to use it only in finding activity ideas, accessing educational materials, parent education. On the other hand, participants with low scores discussed the use of artificial intelligence in areas involving interactive or non-interactive media tools that do not require customization based on user prompts. The confusion about the function of artificial intelligence and the limited examples of its application areas were associated with the limited knowledge of low-scoring participants about artificial intelligence. Other studies conducted through interviews with preschool teachers, it was found that one of the challenges in using AI in the classroom and teaching AI literacy is the teachers' lack of sufficient knowledge and skills (Küçükkara et al., 2024; Su, 2024).

In conclusion, due to the student-centered nature of contemporary education, acquiring the skills pertinent to the current century is critically important for overall life adaptation (Işık & Demirel, 2023). Based on the findings of the research, the following recommendations can be made:

- Surveys to determine the opinions and attitudes of preservice and in-service teachers towards AI can be conducted.
- Intervention programs for the use of AI in education can be developed for teachers and the effect of the program can be investigated with experimental studies
- Trainings on AI tools and the use of AI in education can be planned for in-service teachers.
- Courses on AI tools and the use of AI in education can be included in teacher training programs.
- AI tools that will contribute to family involvement, parent education, and assessment in preschool education can be developed.

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