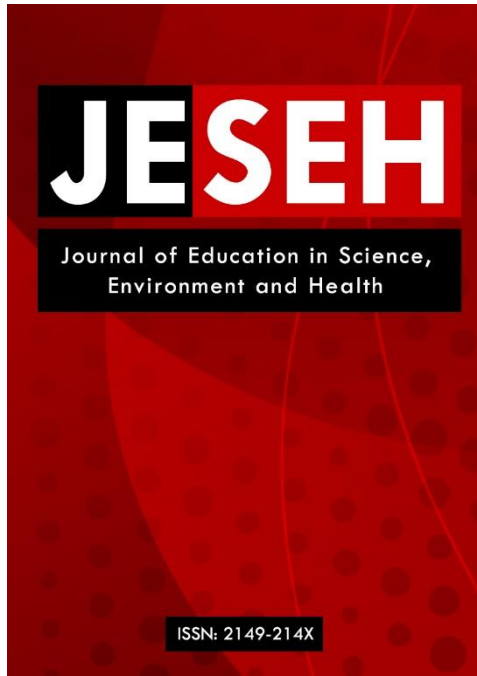




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Anxiety about Artificial Intelligence as an Emerging Field of Science: The Example of Preschool Teacher Candidates

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Abstract

The importance of artificial intelligence in daily life is increasing every day. This situation is inevitably reflected in educational environments. However, using artificial intelligence also causes anxiety. This study aims to determine the anxiety levels of preschool preservice teachers regarding artificial intelligence and examine them using various variables. The study was conducted using a survey, a quantitative research method. Data was collected from 208 volunteer participants using a convenience sampling method. The 16-item Artificial Intelligence Anxiety Scale was used as the data collection tool. t-test, ANOVA, percentage, and frequency were used in data analysis to obtain findings. In addition to the techniques used in interpreting the findings, the criterion for determining the level of artificial intelligence anxiety was used. The interpretation of the research findings revealed that preschool teachers had moderate levels of anxiety regarding artificial intelligence. This anxiety did not differ among preschool teachers' grade levels, daily internet use, knowledge about artificial intelligence, or number of siblings. However, it was found that there were differences in terms of gender.

Introduction

In the Society 5.0 era, the use and development of artificial intelligence was crucial, parallel to industrial developments and technological innovations. In this era, the use of artificial intelligence is inevitable in every field, especially in human resources management (Palos-Sánchez et al., 2022, Lungu, Tabur & Batog, 2025). Its use and support in school settings are also crucial. Because the advancement of technology is expected to create a bright future for artificial intelligence (AI)-supported educational environments (Wang, 2025). AI facilitates accessing, structuring, and using information. It can also guide the use, differentiation, and teaching of existing information.

Concept of Artificial Intelligence and Anxiety

With the rapid development of digitalization in the 21st century, AI is not limited to the technology sector; it has become a pioneer of significant transformations in nearly every field, including education. Defined as the ability of computer-aided systems to perform learning, problem-solving, reasoning, and decision-making skills similar to human intelligence (Russell & Norvig, 2021; Meylani, 2024), AI can continuously improve itself with the data it obtains, learn from previous experiences, and flexibly adapt to new conditions it encounters (Gadhoum, 2022). This advanced technology is actively used in diverse fields such as engineering, sociology, psychology, and education, and is reshaping people's lifestyles (Doğan, 2002; Chui et al., 2018; Luckin et al., 2016).

The use of AI in education provides many innovative opportunities, such as personalized learning experiences, automated grading systems, learning analytics, and content creation (Holmes et al., 2019; Meço & Coştu, 2022). However, these developments also raise several issues, such as data security, ethical principles, a sense of justice, and a lack of social interaction (Köse et al., 2023; Sivanganam et al., 2025). The increasing digitalization of education and the proliferation of AI-based applications have made it imperative for people to develop a conscious awareness of these technologies. However, the technological uncertainties that come with this process can also lead to increased anxiety in people (Beaudry & Pinsonneault, 2010; Johnson & Verdicchio, 2017). Anxiety about AI is defined as a multifaceted psychological state that includes fear, uncertainty, and perception of threat that people feel about unclear situations and unpredictable outcomes in controlling these systems (Rachman, 1998; Brynjolfsson & McAfee, 2014).

Artificial Intelligence in the Context of Preschool Teachers

Preservice teachers' attitudes toward AI, considered a cornerstone of the education system, and their anxiety levels regarding AI have a significant impact on shaping future educational models (Mishra & Koehler, 2006; Henderson & Corry, 2021). While preschool teachers strive to align their pedagogical training with technological advancements, they also face uncertainties about how AI will shape their professional roles, individual autonomy, and the emotional relationships they will establish with their students (Selwyn, 2019; Dinello, 2005). Indeed, various studies indicate that some field teachers lack knowledge about the integration of AI in classroom practices, and therefore sometimes exhibit apprehensive or hesitant attitudes toward AI Technologies (Ertmer & Ottenbreit-Leftwich, 2010; Inan & Lowther, 2010; Uygun, 2024; Fakhar et al., 2024). While it offers significant opportunities in education, teachers' anxiety levels are seen as a significant determining factor in the formation of positive or negative attitudes toward this technology. Preservice teachers, particularly those studying in education faculties, may exhibit some affective reactions when exposed to such technologies early on. This may directly impact their AI literacy, technology integration skills, and instructional design competencies (Banaz & Demirel, 2024; Kaman, 2025).

Current studies indicate that preservice teachers can develop positive attitudes toward AI tools despite their limited knowledge of AI technologies (Fakhar et al., 2024). However, it is striking that systematic studies focusing specifically on early childhood education are insufficient in number (Çevik & Baloğlu, 2007; Yalçınalp & Cabı, 2015; Takıl et al., 2022; Şen, 2024). Preservice preschool teachers' attitudes and anxiety levels toward AI are of particular importance because this group will be working with children in the concrete operational stage and therefore has considerable pedagogical responsibilities regarding technology use. In this context, it can be argued that pre-service preschool teachers' concerns about AI may stem not only from a lack of knowledge but also from many factors such as professional values, ethical responsibilities, and social sensitivity (Parlak, 2017; Sivanganam et al., 2025).

On the other hand, it has been emphasized that AI-supported applications can be used effectively in preschool education, thanks to their advantages in increasing individualized learning opportunities for the early diagnosis and education of some children with learning disabilities (Drigas & Ioannidou, 2012). However, the realization of this positive potential depends on preschool teachers understanding these technologies without anxiety and making them educationally useful.

Importance of Research

While studies on attitudes and anxieties related to technology and AI have increased in recent years, systematic research focusing on preschool teacher candidates remains limited. Studies have focused primarily on teachers' anxiety levels regarding computer and general technology use, and these anxieties have been shown to influence the adoption processes of instructional technologies (Çevik & Baloğlu, 2007; Yalçınalp & Cabı, 2015). However, these studies are largely limited to basic digital skills and do not adequately address preservice teachers' affective responses to more advanced technologies, such as artificial intelligence. Furthermore, some recent studies suggest that teachers may experience anxiety due to factors such as perceptions of diminished professional autonomy in their interactions with AI technologies, difficulties in establishing connections with their students, and resistance to technological innovations (Henderson & Corry, 2021; Kaya et al., 2024).

The use of AI in educational settings has been examined from various perspectives. Studies have included participants such as teachers, preschool teachers, nursing students, and dentists. Yo and Nazir (2021) used AI to improve university students' English language skills, while Rai et al. (2025) used AI to provide better patient care and practical problem solutions for dentists. There are also studies examining university students' attitudes towards AI (Mart & Kaya, 2024; Giray Yakut et al., 2025; Saatçioğlu & Topsakal, 2025). In addition, Kong & Zhu (2025) examined university students' ethics of AI, and Küçükkara et al. (2024) examined preschool teachers' views on AI. Finally, Tarsuslu et al. (2024) examined the AI anxiety levels of nurses, Ülkü et al. (2025) of university students, Arı (2024) of classroom teachers and Banaz (2024) of Turkish teachers. Based on these studies, it was planned to examine the AI anxiety of preschool teacher candidates in order to contribute to both the field and the identification of deficiencies.

Purpose of the Study

The purpose of this study was to examine preschool teacher candidates' AI anxiety levels across various variables, including gender, grade level, internet use, knowledge of AI, and number of siblings. In this context, the following questions were sought.

1. What are the AI anxiety levels of preschool teacher candidates?
2. Is there a significant difference between the gender of preschool teacher candidates and their AI anxiety levels?
3. Is there a significant difference between the grade level of preschool teacher candidates and their AI anxiety levels?
4. Is there a significant difference between the daily internet usage time of preschool teacher candidates and their AI levels?
5. Is there a significant difference between the AI knowledge of preschool teacher candidates and their AI anxiety levels?
6. Is there a significant difference between the number of siblings of preschool teacher candidates and their AI anxiety levels?

Method

The study was conducted using a survey, a quantitative research method. The aim here was to choose a method that would enable rapid and effective solutions to the research problem, while maintaining high levels of reliability and validity (Çepni, 2010). This method is often used to gather the opinions of a specific group on a topic in an unbiased manner. Therefore, this method was chosen in accordance with the purpose of the study. This method was used to determine participants' agreement with the scale items, along with certain variables (Gender, grade level, internet use, and knowledge of AI).

Sample

Convenience sampling was used throughout the study. This method reached the target group of preschool teachers. Participants were invited to participate voluntarily, and those who agreed were provided with the data collection scale. 208 preservice teachers studying at Muş Alparslan University participated in the study. Demographic information for the participating preservice teachers is provided in Table 1.

Table 1. Demographic information of the sample group

Variable		f	%	Variable		f	%
Gender	Female	177	81.10	Knowledge of AI	Yes	145	69.7
	Male	31	14.90		No	63	30.3
Grade Level	1. Grade	90	43.3	Internet Use	1-2 Hour	47	22.6
	2. Grade	80	38.5		3-4 Hour	89	42.8
	3. Grade	18	8.7		5+ Hour	72	34.6
	4. Grade	20	9.6	Number of Siblings	3 or less	48	23.08
					More than 3	160	76.92

An examination of Table 1 reveals that the majority of participants are female (81.10%) and knowledgeable about the use of AI (69.7%). Furthermore, the majority of participants are first grade (43.3%) and second grade (38.5%) students and use the internet 3-4 hours per day (42.8%). Finally, the majority of participants (76.92%) have more than three siblings, meaning they live in a multi-child household. The table indicates that the frequency values of the variables are generally not very close to each other. It should be noted that this may affect data analysis.

Data Collection

Data were collected via a Google form link consisting of two sections: participant demographics and scale items. The demographic information section collected data such as gender, grade level, internet usage history, and knowledge of AI. The original 21-item Artificial Intelligence Anxiety Scale, developed by Wang and Wang (2019) and adapted to Turkish by Akkaya et al. (2021), was used as the scale. The scale items were rated on a 5-point Likert-type scale, ranging from "Strongly Disagree" to "Strongly Agree." The fit indices of the scale were acceptable ($\Delta\chi^2 = 167.218$, $SD = 98$ $\chi^2/SD = 1.706$, $RMSEA = .067$, $NFI = .925$, $RFI = .909$, $CFI = .963$). Cronbach's Alpha reliability value of the adapted scale was determined as 0.81, and in this study, it was calculated as 0.92.

Data Analysis

The data obtained within the scope of the study was transferred electronically to Microsoft Excel, where the variables were coded and transferred to the SPSS package program. Findings were obtained from the data using techniques such as t-test, ANOVA, percentage, and frequency. In addition to the techniques used to interpret the findings, the criteria for determining the level of anxiety in AI were used.

Table 2. Criteria for determining the level of anxiety in AI

Score Range	AI Anxiety Level
1.00-1.80	Very low
1.81-2.60	Low
2.61-3.40	Moderate
3.41-4.20	High
4.21-5.00	Very high

According to Table 2, a specific range is obtained by dividing the scores obtained from a 5-point Likert-style scale by 5. Interpretations are made based on the corresponding values within these ranges. It can be used to interpret the level of an individual or group on a topic (Gülen, 2016). The interpretation corresponding to the range within which the average scores obtained from the scale items fall are used to determine the level.

Results

The findings obtained within the scope of the study are presented in the order of the research questions.

Findings Regarding Preschool Teachers' AI Anxiety Levels

In this section, the responses of preschool teachers participating in the study to the scale items were examined both individually and according to the overall average.

Table 3. Findings regarding preschool teachers' AI anxiety levels

Scale Items	X	SD
1. Item	2.84	1.04
2. Item	2.57	1.02
3. Item	2.5	0.96
4. Item	2.44	1.03
5. Item	2.44	1.02
6. Item	3.42	1.14
7. Item	3.63	1.12
8. Item	3.33	1.19
9. Item	3.57	1.09
10. Item	3.62	1.17
11. Item	3.37	1.05
12. Item	3.47	1.02
13. Item	3.41	1.04
14. Item	3.41	1.18
15. Item	3.39	1.15
16. Item	3.33	1.2
N:208	3.17	1.09

Table 3 shows the means and standard deviations obtained by preschool teacher candidates for each item. When these values are examined and the criteria specified in Table 2 are considered, it can be said that the participants had a moderate level of anxiety regarding almost the majority of the items. Indeed, an examination of the overall meaning ($X=3.17$) indicates that the preschool teacher candidates' anxiety level regarding the use of AI is at a moderate level. Similarly, an examination of the standard deviations for each item reveals homogeneity among participants whose values are close to each other regarding the scale items. In addition to these findings, Table 4 examines the relationship between participants' AI anxiety levels and gender.

Findings Regarding Preschool Teacher Candidates' Gender and AI Anxiety Levels

Table 4. Findings regarding preschool teacher candidates' gender and AI anxiety levels

Gender	N	$\bar{x}$	Std. Deviation	Std. Error Mean	t	p	n ²
Female	177	3.21	.73	.055	2.21	.028	.023
Male	31	2.90	.68	.122			

An independent samples T-test was used to determine the significant difference between the gender of the preschool teachers and their AI anxiety levels. According to the results of this test, a significant difference was determined between the gender of the preservice teachers, and their AI anxiety levels ($p=.028<.05$). This difference was observed to be in favor of females. The difference was considered to be at a good level ($n^2=.023$) based on the impact factor calculation (Cohen et al., 2007). Furthermore, an examination of the participants' grade levels and AI anxiety levels yielded Table 5.

Findings Regarding the Grade Levels and AI Anxiety Levels of the Preschool Teachers

Table 5. Findings regarding the grade levels and AI anxiety levels of the preschool teachers

	Sum of Squares	df	Mean Square	F	Homogeneity (p)	p
Between Groups	2.828	3	.943	1.799	.812	.149
Within Groups	106.915	204	.524			
Total	109.743	207				

An ANOVA test was used to determine the difference between the participating preservice teachers' grade levels and their AI anxiety levels. According to Table 5, no difference was found between AI anxiety levels and grade levels ($P=0.149>0.05$). Similarly, Table 6 was obtained when the participants' daily internet use time and AI anxiety levels were examined.

Findings Regarding Preservice Teachers' Daily Internet Use Time and AI Anxiety Levels

Table 6. Findings regarding preschool preservice teachers' daily internet use time and AI anxiety levels

	Sum of Squares	df	Mean Square	F	Homogeneity (p)	p
Between Groups	.583	2	.292	.547	.914	.579
Within Groups	109.160	205	.532			
Total	109.743	207				

An ANOVA test was used to determine the relationship between the daily internet use time and AI anxiety levels of the participating preservice teachers. According to the findings in Table 6, no difference was found between AI anxiety levels and daily internet use time ($P=0.579>0.05$). Furthermore, Table 7 examines the participants' knowledge of AI, and their AI anxiety levels, yielding the following findings:

Findings Regarding Preservice Teachers' AI Knowledge and AI Anxiety Levels

Table 7. Findings regarding preschool preservice teachers' AI knowledge and AI anxiety levels

AI knowledge	N	Mean	Std. Deviation	Std. Error Mean	t	p
Yes	145	3.19	.74	.061	-1.254	.211
No	63	3.26	.69	.087		

An independent samples t-test was used to determine the difference between preschool teachers' AI knowledge and AI anxiety levels. According to Table 7, there is no significant difference between AI knowledge and AI anxiety levels ($p=>0.05$). Finally, Table 8 was obtained when the participants' sibling status and AI anxiety levels were examined.

Findings Regarding the Number of Siblings and AI Anxiety Levels

Table 8. Findings regarding the number of siblings and AI anxiety levels of preschool preservice teachers

Siblings	N	Mean	Std. Deviation	Std. Error Mean	t	p
3 or less	48	3.20	.83	.119	.406	.685
More than 3	160	3.15	.70	.055		

An independent samples T-test was used to determine the difference between the number of siblings of preschool teachers and their AI anxiety levels. According to Table 8, there is no significant difference between the number of siblings, 3 or less, or more than 3, and the level of AI anxiety ($p=0.685>0.05$).

Discussion

According to the analysis of the research data, it can be said that preschool teacher candidates have a moderate level of anxiety about AI. This anxiety varies by gender, but there is no difference in terms of grade level, daily internet use duration, knowledge about AI, or number of siblings.

Preschool teacher candidates' AI anxiety levels can be said to be moderate (according to the criteria for determining AI anxiety levels). Indeed, it is known that averages around 3 on a 5-point Likert-style scale can generally be interpreted as moderate. Similarly, Arı (2024) and Banaz (2024) determined that the AI anxiety levels of classroom teachers and Turkish teachers were "undecided," meaning moderate. This result is generally related to university students' perspectives on AI. Indeed, there are both positive and negative opinions. Yakut et al. (2025) determined that university students are afraid of AI, while Chen et al. (2024) determined that it causes anxiety and stress. In addition, Küçükkara et al. (2024) determined that preschool teachers are concerned about the lack of sufficient knowledge and studies in the field of AI. Contrary to all these findings, Ülkü et al. (2025) determined that AI anxiety can positively affect innovative behavior. Chen et al. (2024) found that AI anxiety positively impacted university students' motivated learning, while Schiavo et al. (2024) found that AI literacy acceptance was positively affected. Meylani (2024) also determined that teachers' AI anxiety was effective in increasing motivation and participation in technology. Generally, while university students' anxiety about AI is fueled by factors such as fear, anxiety, and the unknown, it appears that they desire to demonstrate innovative initiatives due to factors such as acceptance, motivation, and participation. The balance of these factors is thought to influence the moderate level of AI anxiety among preschool teacher candidates.

It can be said that there is a significant difference between preschool teacher candidates' AI anxiety scores and their gender, favoring women. This difference may be due to the fact that there are four times more women than men. However, Arı (2024) and Banaz (2024) found a difference between AI anxiety and gender in their studies, again favoring women. Similarly, Salimi et al. (2025) found consistency and invariance between AI anxiety and gender in their study. These findings suggest that women may have higher anxiety levels than men. In general, it can be said that women have higher AI anxiety than men.

No difference was found between preschool teacher candidates' grade levels, daily internet use time, knowledge about AI, number of siblings, and AI anxiety scores. This is because the findings for these variables were not significant. This is suspected to be due to the fact that the frequency distributions of the variables are not close to each other. Similarly, Arı (2024) found no significant difference between daily internet use time and AI anxiety in his study. Additionally, Mart and Kaya (2024) and Saatçioğlu and Topsakal (2025) examined AI attitudes in their studies and reached results similar to the findings of the present study. In addition, Kaya et al. (2022) determined a significant difference between the AI knowledge levels and AI anxiety of participants aged between 18 and 51. Wang (2025) determined in his study that preschool teachers' AI-supported educational activities yielded beneficial results. While there are studies that are similar to the research findings, there are also studies that are not. According to these findings, there are generally no significant differences between the demographic information and AI anxiety levels of preschool teachers. This may be due to differences in demographic data frequency values or to participants' lack of knowledge about AI. Ultimately, AI production occurs independently of preservice teachers. However, coordination with AI engineers is necessary to increase preservice teachers' use of AI and ensure its easy integration into education (Zhai et al., 2021).

Conclusion

The interpretation of the research findings revealed that preschool teacher candidates have a moderate level of anxiety about AI. It was found that females differ more than males in terms of AI anxiety levels among preschool teacher candidates. No difference was found between preschool teacher candidates' grade level, daily internet use, AI knowledge, or number of siblings and AI anxiety.

Recommendations

Qualitative studies are needed to determine the reasons for preschool teacher candidates' anxiety levels. It is also recommended to determine AI anxiety levels in other branches or professions of the teaching profession. This is crucial for addressing teachers' predispositions toward AI, understanding the ethical issues surrounding AI, and integrating AI into classrooms. Research is needed to determine the reasons for AI anxiety levels between genders. Studies can clarify the similar prevalence of demographic variables among preschool teacher candidates.

Scientific Ethics Declaration

* The authors declare that the scientific ethical and legal responsibility of this article published in JESEH journal belongs to the authors.

* Ethical approval for this research was approved by the Scientific Research and Ethics Committee of Muş Alparslan University. Meeting number 26 in 2025.

Conflict of Interest

* The authors declare that they have no conflicts of interest

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