

Artificial Intelligence Supported Applications: Awareness Levels of Primary School Teacher

Cevat Eker

Zonguldak Bülent Ecevit University, Zonguldak, Türkiye
E-mail: cevateker@gmail.com

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ABSTRACT This study examined the awareness levels of classroom teachers regarding artificial intelligence-supported applications. The study is based on a descriptive causal comparison method. The study group, determined by the appropriate/convenient sampling method, consists of 204 teachers working in the Zonguldak Province of Turkey in the 2023-2024 academic year. The data were obtained with a demographic information form and a general attitude scale towards artificial intelligence. The obtained data were analyzed using t-test, Anova test and Tukey test techniques and comparisons were made. The research findings showed that classroom teachers' awareness of artificial intelligence applications was high. In addition to this result, there was no difference between the teachers in terms of gender, educational status and desire to do postgraduate education, but a significant difference was observed in favor of teachers with 1-5 professional experience.

INTRODUCTION

Artificial intelligence (AI) is seen as one of the most important and rapidly developing technologies in today's world. While McCarthy (2007) defines AI as the field of science and engineering that deals with the construction of intelligent machines, especially intelligent computer programs, Khanagar et al. (2021) defines AI as an advanced machine that can imitate complex cognitive ability processes unique to humans and skills such as problem solving and decision making. Aydin and Degirmenci (2018) stated that artificial intelligence is the technology of developing machines that can display human-like behavior only by artificial methods, without using any living beings. Popov (1990) defined AI as allowing computers to do what people need to do themselves.

AI technologies are mostly accepted as cognitive regulators which may help organizations and institutions make more accurate and effective decisions by processing huge data. AI technologies also pave the way for the determination of successful teaching techniques by helping to evaluate student knowledge level by taking individual skills into consideration (Woolf 2009). In recent years, we have seen AI applications being used extensively in many areas such as health, finance, shopping and education. AI applications have entered our lives, even if we

do not realize it, with the phone applications we use, our small smart home appliances, autonomous vehicles and many other areas. AI applications can exist in many fields such as medicine, engineering, industry, psychology, mathematics and philosophy, with a framework drawn according to needs.

As AI continues its progress step by step, the uses of it in education field is also increasing. With the help of AI in the field of education, the quality of education has increased with opportunities such as performance monitoring, preparing personal course contents or preparing a teaching model (Karaca and Telli 2019). Today, education appeals to a very wide audience, making it necessary to use artificial intelligence technologies in the sphere of education. AI-supported teaching applications offer significant potential in terms of academic success. These applications provide students with a personalized learning experience and recommend content according to their interests, learning styles and performance. Additionally, it helps students detect and correct their mistakes by providing fast and effective feedback. AI is used to analyze student performance to identify their missing learning and provide teachers with data on students' performance. In this way, teachers better understand the individual needs of students and can organize and apply teaching strategies accordingly. As a result, AI-supported

teaching applications support students to learn effectively and increase their academic success. The most significant advantage of using AI in the sphere of education is that it provides an individual learning environment by diversifying the teaching according to the student (Drigas and Ioannidou 2012). When we look at the areas of use of AI technologies in education field in the past few years, examples such as smart teacher systems, adaptive learning, evaluation of teaching, smart classroom technologies, smart evaluation systems, and educational robots stand out (Joshi et al. 2021).

When the AI studies used in the sphere of education today are investigated, it can be seen that applications that can be considered important in terms of education have been developed. These applications- technologies such as creating personalized education plans that will facilitate students' learning, personalized education applications, student article analysis, smart agents, evaluation systems, and automatic test creation systems are included. If you pay attention, these areas are mostly about supporting learning. According to TeachThought Staff (2013), Artificial intelligence can automate student grading, which is one of the basic activities in education. Educational software can be organized according to student needs. It can guide teachers on where lessons need to be improved. Students can get additional support from their teachers regarding artificial intelligence applications. Students and educators can receive useful feedback through artificial intelligence-oriented programs. With AI applications, students can change the way they access information and the way they interact. Teachers' role in the classroom can change. It can make learning more effective. Data powered by AI can change the way we teach and support. It can provide guidance on how students acquire basic skills.

Today, one of the areas where artificial intelligence technologies are poised to create major changes is education. therefore, the Ministry of National Education in Türkiye aims to enable students to use AI appropriately and effectively for specified purposes in the AI applications course covering 72 hours for each level in secondary school 7th and 8th grades. The AI Applications Course Curriculum is based on an un-

derstanding that the student is responsible for his/her own learning, Interacts with the teacher and course material, actively participates in the process, learns by doing and experiencing, and transfers it to real life through the example applications he develops. It is important for students to benefit from AI applications so that they can solve the problems they encounter in daily life during the course period. However, during the course, teachers need to provide theoretical information in accordance with the interactive teaching approach, as well as develop applications with students and create educational environments that will contribute to students' awareness. It is important that the AI applications course is carried out in a hands-on manner, primarily in information technologies classes or on an interactive whiteboard (Ministry of Education 2023).

Teachers, as one of the most important stakeholders in the education process, have a critical role in the integration and effective use of AI applications in educational environments. Because teachers are one of the most important stakeholders in the education process and the people who know the dynamics of the classroom environment best. Their views on the integration of AI into education are a fundamental resource for understanding how the technology works in practice and how it can be applied in real classroom environments. By closely observing students' learning needs and preferences, teachers can come up with valuable ideas on how AI applications can be integrated into student learning experiences. Teachers' attitudes towards AI technology are critical for the successful adoption and use of these technologies in schools. Positive attitudes and acceptance can encourage the effective use of technology. It is seen that technologies for AI applications in education are developing rapidly (Bai et al. 2024). For this reason, the role of teachers, who are considered as the implementers of curriculum and one of the most important stakeholders of the education process, in the application of AI applications in educational environments is very important. Thanks to AI technologies, teaching methods are expected to change and will enable students to continue their learning processes more effectively. In addition, teachers can monitor students' individual progress with AI technologies, evaluate their performance,

and provide individual support when necessary (Zhang and Lu 2021). In this way, teachers will be able to facilitate students' learning by volunteering to apply these technologies in their classrooms. In recent years, it can be seen that studies on the use of AI in education have appeared in the literature. However, it has been observed that no research has been performed to identify the awareness levels of classroom teachers regarding AI-supported applications. Considering that the people who know the dynamics of the classroom environment best are teachers, Understanding AI applications is crucial for teachers to grasp how this technology functions in practice and how it can be effectively integrated into classroom settings.

AI has been widely used in many areas in recent years, and education is one of them. With AI, students' learning process is being further improved and it is thought that it will have an important place in future learning methods. The advances made by AI in education provide a solid foundation for future learning methods. In this way, students can have more active, personalized and interactive learning experiences. In addition, teachers are made to respond to students' needs more quickly and accurately by making their jobs easier. In implementing curriculums with AI support to students effectively and permanently; it is clear that the thoughts of teachers about the technology of the age, the competence skills of primary school teachers regarding AI applications, and the level of competence in technology are important. Primary school teachers' use of AI technology in lessons can be beneficial in terms of encouraging creative and innovative thinking. Again, AI can provide faster and more permanent access to learning outcomes and sub-learning outcomes in primary school curriculum. In order to use applications effectively, it is important to determine the level of competence first.

Objective of Study

The aim of the research is to investigate the awareness levels of classroom teachers regarding artificial intelligence-supported applications according to various variables (gender, professional experience, educational status, desire to do postgraduate education). For this purpose,

answers to the following questions are sought.

1. What is the level of awareness of primary school teachers' regarding AI-supported applications?
2. Primary School Teachers' awareness levels of AI-supported applications; Is there a significant difference according to gender, professional experience, educational background, and desire to pursue postgraduate education?

METHODOLOGY

Ethics Committee Permission

The research was found appropriate by the human research ethics committee of BEUN, dated 05/09/2024 and protocol number 774.

Research Model

The model of the research is descriptive survey method, one of the quantitative research methods. Descriptive research is a research model based on revealing and explaining the current situations as they were in the past or as they are now (Karasar 2020). The survey method is a systematic examination of the literature, data set or a specific sample in a specific field that provides in-depth analysis of existing information about a particular subject or phenomenon (Creswell 2017). In addition, in this study, the differentiation of classroom teachers' awareness of artificial intelligence-supported applications according to the demographic characteristics (gender, professional experience, educational status, and desire to do postgraduate education) was also examined. In this respect, the research is a causal comparison research.

Population and Sample

The participants of the research include a total of 204 classroom teachers working in primary schools in the Zonguldak province of Turkey in the 2023-2024 academic year and selected using the easy-access or convenience sampling method. The reason for using easy-access or convenience sampling in the study was that the selected participants were in the same province as the researcher and were therefore easily ac-

cessible. The easy-access or convenience sampling method is based on the principle of selecting elements that are easy to reach and useful within the time period examined by the researcher in an unplanned and undesigned manner. The basic assumption of this sampling method is that it is easily accessible and easy to implement in terms of time, money and labor (Cohen et al. 2007). It is seen that 60.8 percent of the 204 teachers participating in the research are female and 39.2 percent are male.

Data Collection Tools

Data in the research were obtained using the “Demographic information form” and the “Teachers’ AI Awareness Scale” scale.

Demographic Information Form: The form includes questions regarding the participants’ gender, professional experience, educational status, and desire to pursue postgraduate education.

Teachers’ AI Awareness Scale: The scale used to collect data in the study was developed by Ferikoglu and Akgün in 2022. The scale, which was developed as a 5-point Likert type, consists of 51 items. These scale items are grouped under four main factors. These factors are: Application knowledge, Belief-Attitude, Ability to Relate and Theoretical knowledge. The internal consistency and item correlations of the scale were determined to determine whether the scale was reliable. The Cronbach’s Alpha value of the scale was calculated as 0.986. The suitability of the data for factor analysis was examined with Kaiser-Meyer-Olkin (KMO) and Bartlett sphericity tests. It was determined that the KMO coefficient was highly reliable with 0.983 and the result of the Bartlett test was significant and reliable at a significance level of $p < 0.01$. In addition, it was determined that the scale item-total score correlations had high correlation levels between 0.556 and 0.867. Although the scale has a four-dimensional structure, the high relationship coefficients between the dimensions indicate unidimensionality. Therefore, the obtained data were evaluated and interpreted based on the total score.

The reliability of the scale in this study is as follows: Cronbach’s α coefficient of the sub-dimension application knowledge: 0.86, the overall correlation coefficient of the items

ranged from 0.44 to 0.77; belief-attitude sub-dimension: 0.88, the overall correlation coefficient of the items ranged from 0.34 to 0.61; relational ability sub-dimension: 0.82, the overall correlation coefficient of the items ranged from 0.36 to 0.68; sub-dimension theoretical knowledge: 0.84, the overall correlation coefficient of the items ranged from 0.34 to 0.72. The Cronbach α coefficient of the overall scale was determined as follows: 0.85. In order to determine the structural validity of the scale in this study, confirmatory factor analysis was conducted on the single-factor structure. As a result of the factor analysis, although the regression coefficient was low, it was significant and since the item total correlation coefficients were above 0.30 in the reliability analysis, no item was removed. Later, correlation values were added to the model between the error variables in line with some arrangements (modifications) suggested by the software. It was determined that these modifications created a structure that provided an acceptable fit index for the single-factor, 51-item scale

Data Collection and Analysis

The data of the study were collected from 204 classroom teachers working in a province in the Western Black Sea Region of Turkey in the 2023-2024 academic year. After the researcher gave the necessary information to the teachers in the study group about the purpose of this research, data collection tools were distributed; they were asked to respond. The analysis of the data obtained was made through the SPSS 20.0 package program. Frequency, percentage, mean and deviation (Sd) were used to describe the data in the research. Kurtosis and skewness coefficients were examined with the Shapiro-Wilk test to determine whether the scores were normally distributed. The Shapiro-Wilk test is preferred when the scale items are below 20 (Razali and Wah 2011). It was observed that the kurtosis and skewness coefficients examined were in the range of ± 1 . Shapiro-Wilk test was performed as a normality test. According to the test results ($p = 0.00 > 0.25$), it was observed that it showed a normal distribution. Since the data showed normal distribution, independent samples t test and anova test were used, and Tukey

Test was used to determine the source of the difference. In all the statistical analyses, the significance level was evaluated at the level of $p < .05$.

RESULTS

In order to measure the level of awareness of Primary School Teacher regarding artificial intelligence-supported applications, arithmetic mean and standard deviation values were used. The findings are presented in Table 1.

Table 1 shows the mean and standard deviation values of classroom teachers' awareness levels of AI-supported applications. According to this table, the scores teachers received from the "Practical knowledge" sub-dimension are ($\bar{X}=3.22$; $Sd=.88$). Teachers' awareness levels of this dimension are at the "undecided" level, and the scores obtained from the "Belief-attitude" sub-dimension are ($\bar{X}=4.22$; $Sd=.64$). Teachers' awareness levels of this dimension are at the "I definitely agree" level, and the scores obtained from the "Ability to associate" sub-dimension are ($\bar{X}=3.74$; $Sd=.44$). Teachers' awareness levels of this dimension are at the "I agree" level, and the scores obtained from the "Theoretical knowledge" sub-dimension are ($\bar{X}=3.34$; $Sd=.58$). It is seen that the teachers' awareness level of this dimension is at the "Undecided" level. The overall measurement tool shows classroom teachers' awareness levels of AI applications as ($\bar{X}=4.02$; $Sd=.56$). Accordingly, it seems that teachers' awareness is at the "I agree" level.

The t-test results for the comparison of classroom teachers' awareness levels regarding artificial intelligence-supported applications by gender are given in Table 2.

Table 2 shows that primary school teachers' awareness levels of AI-supported applications are compared according to the gender variable. The mean score of female teachers was found to be ($\bar{X}=3.88$) and the standard deviation value was ($Ss=.78$). The mean score of male teachers was found to be ($\bar{X}=3.72$) and the standard deviation value was ($Ss=.74$). Whether there was a notable difference between gender variable scores was calculated with the t test. Obtained [$t=.32$; It was observed that there was no notable difference with the [$P>.05$] value. Findings regarding the comparison of the awareness levels of classroom teachers participating in the research regarding AI-supported applications according to the professional experience variable are shown in Table 3.

Table 3 shows the analysis of variance (ANOVA) results regarding the professional experience variable of primary school teachers' awareness of AI-supported applications. Teachers' awareness levels of AI applications were determined according to their professional experience [$F=1.13$; $P<.00$] It was observed that there was a statistically significant difference with the [$p<.05$] value. Tukey post-hoc tests were used to detect significant differences between groups. Looking at the Tukey test results, there is a notable difference between teachers with 1-5 professional experience and other teachers. The signifi-

Table 1: Arithmetic mean and standard deviation values of primary school teachers' awareness of AI-supported applications

Subdimensions	N	Min.	Max	\bar{X}	Sd
Practical knowledge	204	1.00	5.00	3.22	.88
Belief-attitude	204	1.00	5.00	4.22	.64
Ability to associate	204	1.00	5.00	3.74	.44
Theoretical knowledge	204	1.00	5.00	3.34	.58
Teachers' AI Awareness Scale	204	1.00	5.00	4.02	.56

Table 2: t-test results showing the differences of teachers in terms of gender variable

Scale	Gender	N	\bar{X}	Sd	t	P
Teachers' AI Awareness Scale	Female	124	3.88	.78	.32	.38
	Male	80	3.72	.74		

Mean difference is significant at $p < 0.05$

Table 3: ANOVA results showing the difference in teachers' professional experience variable

Scale	Professional experience	N	\bar{X}	Sd	F	p	Tukey
Teachers' AI Awareness Scale	1-5	14	4.44	.64	1.13	.00	1>2
	6-10	35	4.00	.47			1>3
	11-15	44	4.02	.83			1>4
	16-20	84	3.82	.64			1>4
	20+	27	3.78	.66			

Mean difference is significant at $p < 0.05$

cant difference is in favor of teachers with 1-5 professional experience. In other words, the awareness level of teachers who have just started their careers regarding AI applications is higher than other teachers. The findings of the comparison of the perceptions of the primary school teachers' participated in the research towards artificial intelligence-supported applications in accordance with the educational level variable are given in Table 4.

Table 4 shows that classroom teachers' awareness levels of AI-supported applications are compared according to the educational level variable. Teachers' awareness levels of AI applications according to their educational level the average score of undergraduate teachers was found to be ($\bar{X}=3.48$) and the standard deviation value was ($Sd=.62$). The average score of Master or doctoral teachers was found to be ($\bar{X}=3.64$) and the standard deviation value was ($Sd=.54$). Whether there was a significant difference between the educational status variable scores was

calculated with the t test. Obtained [$t=.42$; $P>.05$] It was seen that there was no notable difference with the [$P>.05$] value. The findings of the comparison of the perceptions of the primary school teachers participating in the research towards AI-supported applications according to the variable of desire to do postgraduate education are shown in Table 5.

Table 5 shows the analysis of variance (ANOVA) results regarding the variable of primary school teachers' awareness of AI-supported applications and their desire to do postgraduate education. Teachers' awareness levels of AI applications were determined according to the Willingness to do postgraduate education variable [$F=1.58$; $p>.05$]. There was not statistically notable difference with the value.

DISCUSSION

The aim of the study was to determine the awareness levels of classroom teachers regard-

Table 4: T-test results showing the difference in terms of teachers' educational status variable

Scale	Education level	N	\bar{X}	Sd	t	P
Teachers' AI Awareness Scale	Undergraduate	162	3.48	.62	.42	.28
	Master or doctoral	42	3.64	.54		

Mean difference is significant at $p < 0.05$

Table 5: ANOVA results showing the difference in teachers' willingness to do postgraduate education variable

Scale	Willingness to do postgraduation education	N	\bar{X}	Sd	F	p
Teachers' AI Awareness Scale	Yes	45	4.12	.54	1.58	.22
	No	22	3.94	.57		
	Indecision	137	3.92	.53		

Mean difference is significant at $p < 0.05$

ing artificial intelligence-supported applications according to various variables (gender, professional experience, educational status, desire to pursue postgraduate education). Data were collected from a total of 204 classroom teachers working in primary schools in the Zonguldak Province of Turkey. The findings showed that teachers' awareness levels regarding artificial intelligence applications were high.

This result means that it is important for teachers to see themselves as competent in facilitating students' access to information in classroom practices and enabling them to utilise technological tools to use information. The global education and training system is now constantly evolving to keep pace with the use of AI applications. Thanks to AI applications, teachers can prepare personalised learning plans by identifying students' individual learning needs, design different activities that support AI applications in the learning and teaching process and at the same time highlight the student, and automatically evaluate student performance. When the literature was examined, the researcher came across studies that supported the findings of this study. For example, İçöz and İçöz (2024), as a result of their research in which they examined the awareness levels of prospective Turkish teachers about AI applications in terms of different variables, stated that the awareness levels of prospective teachers about AI applications were high. Çam et al. (2021), in a study in which they examined the knowledge of prospective teachers about AI technologies, stated that prospective teachers were aware of these technologies although they touched on different points. In addition, prospective teachers mentioned that artificial intelligence technologies can be used extensively in the fields of medicine and education in our daily lives. They stated that these technologies can be used in the education and training process in order to teach lessons, carry out in-class teaching practices, support the teacher, evaluate students individually and eliminate their deficiencies. Chounta et al. (2022) examined the views of teachers on the use of artificial intelligence and concluded that teachers have limited knowledge about artificial intelligence and the use of artificial intelligence, while at the same time they think that the use of artificial intelligence in education is an opportu-

nity. In the study conducted by McGrath et al. (2023) with 1773 academics, it was emphasised that academics have concerns about fear, suspicion, anxiety and responsibility towards the use of AI in courses. In the same study, it was concluded that academics did not consider themselves sufficient in terms of using artificial intelligence and accessing resources for the use of artificial intelligence. In a different study, the perspectives of primary school teachers on the use of artificial intelligence in education were examined and it was seen that teachers thought that the use of artificial intelligence applications in education would help classroom activities and that it was the most appropriate method for problem-based learning. Banaz and Demirel (2024), based on the findings of the study in which they examined the AI literacy of prospective Turkish teachers according to different variables, concluded that the AI literacy of prospective teachers was close to high level. Yazici and Erkoç (2023) stated that AI facilitates learning and contributes to individualized learning, and that teachers have a positive approach to the use of AI. Chocarro et al. (2021) in their study on teachers' attitudes towards AI-supported Chat robots, they stated that teachers' ability to decide on the design and communication capabilities of Chat robots will be beneficial in terms of acceptance of developments in education. Today, the role of artificial intelligence technology in education is increasing. Teachers aim to make their lessons more interesting by using technology effectively.

It was observed that there was no difference in the awareness levels of primary school teachers regarding AI supported applications according to the variables of gender, education level, and desire to do postgraduate education, but there was a significant difference in favor of teachers with 1-5 years of experience in terms of professional experience variable. This shows that professional experience is important in AI awareness. Today's evolving student demographics, the influence of emerging technologies, and the shifting requirements of the business world are all impacting the education and training offered in schools. This situation may have given the responsibility of improving themselves by applying new technologies in the classroom environment to the new teachers. In

a similar study, Uyak et al. (2023) stated that there was not notable difference in teachers' attitudes towards AI according to their demographic variables. It has been observed that there are studies in the literature that contradict this finding of this research. Banaz and Demirel (2024) stated that the gender of teacher candidates is a variable affecting their artificial intelligence literacy levels and that there is a significant difference in favor of female teacher candidates. Tan et al. (2023) found that teachers' attitudes toward AI vary based on their years of service.

AI has the opportunity to offer content that suits students' individual learning styles and speeds. These systems evaluate student performance, identify areas where they are unsuccessful, and can individualize the learning process by suggesting special resources and materials in these areas. This is a great advantage, especially for students with different learning needs. AI in education provides many benefits, from improving individual learning experiences to optimizing management processes and increasing access to educational materials. In the future, the impact of AI in education will increase even more, making learning processes more efficient. Educators and decision-makers should strengthen education systems by adopting AI technologies and provide a better learning experience for each student. AI does not change the role of teachers, but rather supports them. These systems help teachers analyze student performance, enrich course content, and improve teaching methods. In this way, teachers can create a more effective learning environment. It can be said that AI supported applications, which are the latest products of today's technologies, affect teachers' attitudes towards this technology. When the field of education system is considered, it is seen that it is established on three sections: student, teacher and curriculum. These areas contribute to the development of the quality of education among themselves in a proportional way. The important variable for this process to progress effectively is the teacher. With the development of artif AI technologies, it is of great importance for teachers to understand and use these technologies effectively. AI education provides potential to increase student success in the classroom by providing teachers with new tools, skills and strategies. Teachers can

monitor student performance, create customized educational materials and provide appropriate feedback to students using AI-based applications. Since applications based on AI technologies are developing and spreading very quickly today, teachers should focus on developing their skills in using and managing AI technologies.

CONCLUSION

The findings of this study, which investigated the awareness levels of classroom teachers towards artificial intelligence-supported applications according to various variables (gender, professional experience, educational status, desire to do postgraduate education), revealed that classroom teachers have high awareness levels towards artificial intelligence applications. It also showed that there was no significant difference in teachers' awareness levels towards artificial intelligence-supported applications according to the variables of gender, educational status, desire to do postgraduate education, but there was a significant difference in favor of teachers who were new to the profession and had 1-5 years of experience.

RECOMMENDATIONS

Based on the findings, it can be said that classroom teachers' awareness levels of AI applications are high. However, in order for AI technologies to be used in education in a desired way, these technologies must first be well known by teachers, and how AI will be used in creating effective education and training processes must be well determined. For this reason, in-service training can be organized to ensure that teachers gain knowledge, experience and awareness about AI applications.

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