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Primary school teachers' acceptance levels of educational technologies

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Abstract

The purpose of this research is to determine the acceptance level of primary school teachers about educational technologies. The research was designed in accordance with the qualitative research method. The study group of the research consists of 40 primary school teachers teaching in the city of Almaty, Kazakhstan, in the 2021–2022 academic year. Research data were collected with a semi-structured interview form developed by the researchers. The research data were converted into findings using the content analysis method. As a result of the research, it has been revealed that the majority of primary school teachers find themselves sufficient to benefit from educational technologies. However, the majority of the teachers who participated in the research stated that they sometimes use technology in education. The majority of primary school teachers participating in the research stated that technology-supported education is effective on students' success. In this direction, in order to increase primary school teachers' use of technology in education, it is recommended to establish infrastructures that will provide technology-supported education in schools and to organise in-service programmes for teachers.

Keywords: Educational technologies, primary school, teacher opinions;

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1. Introduction

Rapid developments in science and technology and changes in social needs impose new duties and responsibilities on education (Johannesen & Eide, 2000). The aim of the modern education system is to raise individuals who search for ways to reach information, know where and how to use the information they have learned and have critical thinking (Daugherty, 2005). This is possible with qualified teachers who always renew themselves depending on the developing science and technology (Ozdamli, & Uzunboylu, 2015).

1.1. Theoretical and conceptual framework

Technology shows itself in every aspect of daily life. It is known that technology, which has become an indispensable element of our age, is used actively in every field from communication to commerce, from banking to education (Ottenbreit-Leftwich et al., 2012; Romero, Plaza, & Orfali, 2019). In addition, information and communication technologies, which are developing more and more each day, provide ease of access to information. It is seen that technology, which makes knowledge production a tool, undoubtedly changes the learning–teaching process (Perdana, Jumadi, & Rosana, 2019). It is stated that educators use technology in order to satisfy the individual's hunger for knowledge, to increase the efficiency in learning–teaching activities, to provide diversity in teaching methods based on individual differences and to eliminate deficiencies in teaching–learning environments (O'Dwyer, Russell, & Bebell, 2004). Accordingly, it is seen that the education ministries of various countries are making different efforts to ensure the integration of technology into educational environments in schools (Chen, Looi, & Chen, 2009). In this age of technology, where innovations are accelerating, teachers need to follow technological developments, work on using technology appropriately and meaningfully for students, and improve themselves throughout their professional lives in order for social development and successful progress in education (Blackwell, Lauricella, Wartella, Robb, & Schomburg, 2013; Kaya & Yilayaz, 2013).

The use of technologies used in both daily life and learning–teaching processes in accordance with their purpose is important in revealing the expected benefit (Blannin, 2015). First of all, teachers should have the ability to use the technology in question correctly, and then they should provide it to their students. In other words, educational technology is a field based on change. All products, theories, ideas, practices and tools developed by educational technologists are essentially aimed at changing the way people teach and learn (Roberts, 2008).

The effects of technology use include both approach and practice structures. The way of approach provides an understanding of teachers' decisions and perceptions (Lee & Solmon, 2005). The approach can clarify the elements (decisions) educators make in teaching and how they prepare for teaching technology. Teachers' approaches and experiences are factors associated with computer use. A combination of technology skills and a positive approach is considered to be a pioneer for the effective use of technology (Vannatta & Nancy, 2004). In order for technology to make the education process effective, it is not enough to take part in the process alone. However, when teachers use technology correctly and integrated with their teaching content, an effective education and training process can be achieved (Miranda & Russell, 2012).

This depends on teachers having sufficient knowledge and skills in this regard (Koehler & Mıshra, 2005). In order to benefit from technology in education, teachers should be trained in a well-equipped way, i.e., by giving importance to their quality. Teachers are the most important factors in the development of a society becoming an information society (Collier, Weinburgh, & Rivera, 2004). In addition, teachers need to know how to make the best use of technology in education in order to be an effective guide to their students in the teaching-learning process with the innovations brought about by today's world (Yavuz & Coskun, 2008).

1.2. Related research

Pompeo (2004) examined the examples of successful technology integration, the key elements behind the implementation of successful technology integration and the effects of technology integration on secondary education institutions. According to the results of the research, resources that will enable technological opportunities are of great importance for successful technology integration. In their research, Adeoluwa, Aboderin, and Omodara (2013) aimed to determine the technology use levels of teachers and administrators working in secondary education institutions. In the research, it has been stated that educational technologies have benefits such as making education interesting, supporting distance education applications, being useful for individual differences, making education more efficient and providing more effective learning opportunities.

In their study, Teo and Milutinovic (2015) tried to determine the wishes of pre-service teachers to use technology in mathematics teaching and the effect of age and gender variables on technology use. 313 teacher candidates from Serbia participated in the research. According to the results of the research, they concluded that the attitudes of teacher candidates towards computer use directly affect the use of technology. In addition, it has been determined that all other factors indirectly affect the use of technology. In the study, no significant relationship was found according to age and gender variables. Mulcahy (2005) measures the level of use of information and communication technologies in various fields, including lesson preparation and classroom use, of teachers working at primary and secondary education levels in Ireland. As a result of the research, it was revealed that teachers working in primary education use information and communication technologies more than those in secondary education.

Lim and Khine (2006) examined the views of teachers and administrators in schools that were successful in integrating technology. As a result of the study, it has been determined that it is necessary to have experts in this field in the integration of technology, to train students who will help teachers in the integration of technology, to allow time for teachers to use technology, to cooperate with their colleagues, to support teachers in the use of technology by school administrators and to ensure that teachers' professional development is continuous. In the study conducted by Domingo and Gargante (2016), the perception of teachers about the effect of mobile technologies on learning is examined. The research is based on the data obtained from a total of 102 teachers working in 12 different primary education institutions in Spain, which can offer the best technological opportunities of the period. According to teacher perceptions, the biggest effect of mobile technologies used in the classroom on learning is facilitating access to information.

Khaliq, Baig, Bakhsh, and Ahmad (2017) examined the effects of information and communication technologies on the professional development of teachers working in secondary schools. According to the data obtained from 296 teachers working at high school level, the use of information and communication technologies by teachers has a positive effect on teaching processes. Accordingly, the use of technology in education ensures a more efficient use of lesson time, facilitates access to information, reveals a more effective teaching and increases student–teacher interaction. In addition, the use of technology in education contributes positively to the personal and professional development of the teacher.

1.3. Purpose of the research

The purpose of this research is to determine the acceptance level of educational technologies of primary school teachers. For this purpose, the following sub-objectives have been determined.

1. What are primary school teachers' views on educational technology competencies?
2. What are primary school teachers' views on the use of technology in education?

3. What are the primary school teachers' views on the effect of technology-assisted education on students' success?

2. Method and Materials

2.1. Research method

The research was designed in accordance with the qualitative research method. Qualitative research is a method that inquires about the problem it examines, interprets and tries to understand the form of the problem in its natural environment. Qualitative research is one of the forms of knowledge production developed by people to understand their own potential, to solve their secrets and to explore the depths of the social structures and systems they have built with their efforts. In studies designed with qualitative method, there is an effort to reach a deep perception about the event or phenomenon examined (Malterud, 2001). Accordingly, in this study, it was deemed appropriate to use the qualitative research method in order to determine the acceptance levels of primary school teachers about educational technologies.

2.2. Participants

The study group of the research consists of primary school teachers who are teaching in the 2021–2022 academic year in Almaty, Kazakhstan. Primary school teachers participating in the study volunteered to participate. Demographic characteristics of primary school teachers participating in the research are given in Table 1.

Table 1
Demographic Characteristics of Teachers

Experience	**Gender**		**Sum**
	Female	Male	
1–5 years	5	4	9
6–10 years	5	8	13
11–15 years	1	9	10
16 years and more	6	2	8
Sum	17	23	40

In Table 1, the gender and experience distributions of the teachers participating in the research are given. 9 of the teachers have 1–5 years of experience, 13 of them 6–10 years, 10 of them 11–15 years and 8 of them have 16 years or more experience. 17 of the teachers are female and 23 of them are male. A total of 40 teachers participated in the research.

2.3. Data collection tools

Research data were collected with a semi-structured interview form developed by the researchers. While the semi-structured interview form was being created by the researchers, experts' opinions were sought. Experts expressed their opinions on the appropriateness of the questions in the draft form. The questions in the semi-structured interview form, which was rearranged taking into account the recommendations of the experts, are as follows:

1. What are your views on your educational technology competencies?
2. What are your views on the use of technology in education?
3. What are your views on the effect of technology-supported education on students' success?

In the semi-structured interview form, there are two questions to determine the demographic characteristics of the primary school teachers participating in the research. There are three open-ended questions to determine the educational technology competencies of primary school teachers.

2.4. Data collection process

During the data collection process, one-on-one interviews were conducted with primary school teachers. During the interviews, the teachers were given detailed information about the ethical principles and content of the research. Then, the teachers were asked to answer the questions in the semi-structured interview form. The interviews with the teachers lasted approximately 30–35 minutes. It took approximately 1 month to complete the interviews with all the teachers participating in the research.

2.5. Data collection analysis

The research data were converted into findings by content analysis method. Content analysis requires a more detailed examination of the collected data and reaching the concepts, categories and themes that explain this data. Content analysis focuses on collected data; codes were extracted from the events and facts that were frequently repeated in the data set or that the participant emphasised heavily. One can go to categories from codes and to themes from categories. In short, data (codes) that are found to be similar and related to each other are interpreted by bringing them together within the framework of certain concepts (categories) and themes. In content analysis, the content of participants' views is systematically separated (Bengtsson, 2016). In this direction, the answers given by the teachers participating in the research to the questions in the semi-structured interview form were converted into tables by creating frequency and percentage tables in accordance with the content analysis method.

3. Results

In Table 2, the opinions of the teachers participating in the research regarding their educational technology competencies were evaluated.

Table 2

Opinions of Teachers on Educational Technology Competencies

Category	Theme	*F*	%
Very sufficient	It is very sufficient to follow the developments related to new technologies in education in spare time. It is very sufficient to be interested in technology-related topics. When I encounter a new technology, it is very sufficient to try to use it or learn about its features. Very proficient in using technological tools	1	2.5
Sufficient	Sufficient in integrating technology and course content in education. Sufficient in providing student motivation through technology. Adequately endearing technological tools to students.	23	57.5
Partially sufficient	Partially adequate in solving problems arising from the use of technology in the classroom and education. Partially sufficient to follow educational technologies regularly. Partially sufficient in solving the problems that occur when using educational technologies.	8	20
Insufficient	Inadequate in the use of unconventional technological materials.	5	12.5

	Inadequate in educating students with educational technologies. Insufficient supply of educational technology materials.		
Very insufficient	Inadequate participation in courses or seminars on the use of technology in education. Very inadequate in combining technology and education programme.	3	7.5
Sum		40	100

In Table 2, the views of the teachers participating in the research regarding their educational technology competencies are categorised. 2.5% of the teachers stated that they are very competent in the field of educational technologies, 57.5% stated that they are sufficient, 20% stated that they are partially sufficient, 12.5% stated that they are insufficient and 7.5% stated that they are very inadequate.

In Table 3, the opinions of the teachers participating in the research on the use of technology in education were evaluated.

Table 3

Opinions of Teachers on the Use of Technology in Education

Category	**Theme**	***F***	**%**
Always	Always making use of technological tools. Encouraging students to always benefit from educational technologies.	2	5
Often	Frequent enrichment of education through educational technologies. Creating a fun learning environment often with educational technologies. Frequently motivating students to use technological equipment.	7	17.5
Sometimes	Ability to sometimes select appropriate technological equipment according to the educational environment. Presenting information sometimes through educational technologies.	26	65
Rarely	Rarely processing and managing information through educational technologies. Rarely monitoring student progress using educational technologies.	3	7.5
Never	Never being able to design educational technologies, tools and equipment according to the educational environment. Never making an assessment with educational technologies.	2	5
Sum		40	100

In Table 3, the views of the teachers participating in the research on the use of technology in education are categorised. 5% of the teachers stated that they always use technology in education, 17.5% stated that they use it frequently, 65% stated that they sometimes use it, 7.5% stated that they rarely use it and 5% stated that they never use it.

In Table 4, the opinions of the teachers participating in the research on the effect of technology-assisted education on the success of the students were evaluated.

Table 4

Teachers' Views on the Effect of Technology-Assisted Education on Students' Success

Category	Theme	*F*	%
Very efficient	Very effective in making it easy to learn. It is very effective in providing learning while having fun.	2	5
Efficient	Effective in reinforcing educational technologies. Effective in ensuring that knowledge is permanent. Effective for continuing learning at home.	29	72.5
A little effective	Slightly effective in terms of providing an active learning environment. Slightly effective in terms of providing social interaction.	4	10
Ineffective	Ineffective for students to solve the problems encountered. Ineffective in increasing students' willingness to learn.	3	7.5
Very ineffective	Very ineffective as it cannot be used in every subject area. Very ineffective for students who are not interested in technology.	2	5
Sum		40	100

In Table 4, the views of the teachers participating in the research on the effect of technology-assisted education on student achievement are categorised. 5% of the teachers stated that they found the effect of technology-supported education on student success very effective, 72.5% stated that they found it effective, 10% stated that they found it somewhat effect, 7.5% stated that they found it ineffective and 5% stated that they found it very ineffective.

4. Discussion

The majority of the primary school teachers participating in the research stated that they found themselves sufficient to benefit from educational technologies. Ozarslan, Cetin, and Saritas (2013) found in their study that physics, chemistry and biology teacher candidates' attitudes towards information and communication technologies are at a moderate level. In their study, Chang, Tsai, and Jang (2014) compared the technological pedagogical content knowledge of high school science teachers working in Shaanxi and Taiwan regions of China and the information and communication technologies they use most. As a result of the research, it was determined that the teachers' use of educational technologies is high. In the study conducted by Bang and Luft (2013), the technology use of 95 new high school science teachers from 5 different states in the United States and the factors that facilitate or complicate their use of technology in the first 5 years were discussed. In the study, it was understood that gender and socio-economic status are among the important factors affecting teachers' technology use. Accordingly, male teachers' use of PowerPoint and software is significantly higher than female teachers. A negative correlation was found between socio-economic status and use of PowerPoint. Rowand (2000) examined the possibilities, behaviours and attitudes of teachers working in primary and secondary education regarding computers and the Internet. As a result of the study, it was determined that 39% of the teachers had computer and Internet-related facilities. It has been determined that teachers use the internet to acquire new information in their educational activities.

The findings obtained from the research reveal that the majority of teachers sometimes use technology in education. Russell, Bebell, O'Dwyer, and O'Connor (2003) examined 2894 teachers' use of technology for educational purposes both inside and outside the classroom. According to the results of the research, while teachers use technology more in preparation for the lesson and in communication processes, they give less space to technology during the delivery of teaching or creating learning activities. In their study, Korucu and Sarı (2019) evaluated pre-service teachers'

intentions to use information technologies in their future lessons, gender, having a computer and having Internet access. As a result of the data obtained in the research, it was determined that there is a significant difference in the intentions of these pre-service teachers to use information technologies in their future lessons, gender and having Internet access. It was determined that there was no significant difference between the pre-service teachers' intentions to use information technologies in their future lessons and having a computer. In his research, Weiss (2009) examined the use of technology by teachers and their use of technology in their lessons. As a result of the study, it was revealed that the teachers in the study had advanced computer skills and almost all of them started to use technology in the lessons.

The majority of primary school teachers participating in the research stated that technology-supported education is effective on students' success. Kramarski and Feldman (2000) concluded in their study that although the Internet-supported environment increased students' motivation towards the lesson, the metacognitive awareness levels in the Internet-supported environment were not different compared to the control group. Hannafin, Burruss, and Little (2001), on the other hand, concluded that the use of technology increases students' active participation in the lesson, increases their motivation and helps students develop their mathematical association skills. When the studies conducted in the field are examined, it has been revealed that the use of technology in teaching subjects at almost all levels of education and in many branches affects the success of students positively (Jimoyiannis & Komis, 2001; Mamalougos, Kollias, & St, 2003; Squire, Barnett, Grant, & Higginbotham, 2004).

4. Conclusion

In today's world where science and technology are developing rapidly, it is no longer possible to transfer and memorise knowledge with traditional teaching methods. In this regard, the curriculum programmes have been changed. Instead of raising individuals loaded with rote-based knowledge, it is necessary to raise individuals who think freely, creatively and scientifically, question events, realise problems and produce solutions, have the ability to make decisions, produce knowledge and have high self-confidence. Since the use of technology is a skill in education programmes, it is inevitable that teachers and teacher candidates who will implement this programme also have an attitude towards technology. Education and technology are two concepts that activate the development of the individual. The main purpose of both is to contribute positively to the development of the person. Technology contributes to education by making learning permanent, effective, accessible and enjoyable. With the increase in the needs of the individual, education and technology act together more than in the past. It is necessary to examine these two concepts together in order to see the effect of the rapid progress of technology on education and to give education a scientific and technological quality. Accordingly, in this study, it was aimed to evaluate the acceptance levels of primary school teachers about educational technologies. As a result of the research, it has been revealed that the majority of primary school teachers find themselves sufficient to benefit from educational technologies. However, the majority of the teachers who participated in the research stated that they sometimes use technology in education. The majority of primary school teachers participating in the research stated that technology-supported education is effective on students' success.

6. Recommendations

The findings obtained from the research reveal that primary school teachers have high proficiency in using technology in education, and their frequency of use is moderate. In addition, teachers argue that the use of technology in education positively affects the success of students. In this direction, in order to increase primary school teachers' use of technology in education, it is necessary to establish infrastructures that will enable technology-supported education in schools. In-service training programmes should be organised to enable primary school teachers to benefit more effectively from

ethical technologies. It is also important to carry out studies that reveal the factors that negatively affect the use of technology in education by primary school teachers.

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