Evaluation of primary school managers' duties in digital transformation

Avaliação dos deveres dos gestores das escolas primárias na transformação digital

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Abstract

This research examines the knowledge of managers about technology leadership, metaverse and artificial intelligence and will determine to what extent managers can adapt to the new age. This study evaluates the digital skills, awareness of digital transformation and effective use of digital tools by school administrators with the increasing use of digital technologies in the education of teachers and students. In order to obtain all these data, open-ended questions were asked to the school administrators. The study group of this research, which was conducted with a qualitative study, consists of school principals and assistant principals working in primary schools in Northern Cyprus in the 2022-2023 academic year. The working group consists of 18 participants. The results of the research show that school administrators play an important role in developing their digital skills and successfully managing digital

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transformation. When the ideas are examined in general, it is argued that the main goal of adapting to the modern age is to bring all the necessary technological tools to the school, to inform the teachers about artificial intelligence and metaverse before students, and to develop their skills in using technological devices. School administrators also stated that if they have their own inadequacies before teachers, it is necessary to improve themselves in these areas, which will benefit the school and students in digital transformation. Artificial intelligence and metaverse technologies would cost schools very high and that the schools would not be able to cover the costs of these technologies.

**Keywords:** Artificial Intelligence. Management. Professional Development. School Administrators. Technology Leadership.

**Resumo**

Esta pesquisa examina o conhecimento dos gerentes sobre liderança tecnológica, metaverso e inteligência artificial e determinará até que ponto os gerentes podem se adaptar à nova era. Este estudo avalia as habilidades digitais, a consciência da transformação digital e o uso eficaz de ferramentas digitais por administradores escolares com o uso crescente de tecnologias digitais na educação de professores e alunos. A fim de obter todos esses dados, foram feitas perguntas abertas aos administradores da escola. O grupo de estudo desta pesquisa, que foi realizada com um estudo qualitativo, consiste em diretores escolares e diretores assistentes trabalhando em escolas primárias no Norte de Chipre no ano letivo de 2022-2023. O grupo de trabalho é composto por 18 participantes. Os resultados da pesquisa mostram que os administradores escolares desempenham um papel importante no desenvolvimento de suas habilidades digitais e na gestão bem-sucedida da transformação digital. Quando as ideias são examinadas em geral, argumenta-se que o principal objetivo da adaptação à era moderna é trazer todas as ferramentas tecnológicas necessárias para a escola, informar os professores sobre inteligência artificial e metaverso antes dos alunos, e desenvolver suas habilidades na utilização de dispositivos tecnológicos. Os administradores escolares também afirmaram que, se eles têm suas próprias inadequações perante os professores, é necessário melhorar a si mesmos nessas áreas, o que beneficiará a escola e os alunos em transformação digital. A inteligência artificial e as tecnologias metaversivas custaria às escolas muito caro e que as escolas não poderiam cobrir os custos dessas tecnologias.

Evaluation of primary school managers' duties in digital transformation

Introduction

In today's world, education has become inseparable from technology. The impact of technology has caused changes in the way people live, work and learn. Compared to the past, students growing up in the digital age need to develop their technological skills necessary to be successful. This situation creates the need for restructuring of education curricula (Torres & Stati, 2019).

As Akbaşlı and Durnalı (2017) stated, today's age is an era in which new information is constantly produced, information sharing tools are constantly renewed, and consumption is intense. This period is also known as the "Information Age" and it becomes a science and art tool for the accumulation of new information in different disciplines by constantly making researches, inventions and discoveries, creating works of art, as an irresistible necessity of the consumer society or with a high motivation to develop. This information can be embodied as important new or current technologies that facilitate activities in both individual and organizational life.

Advances in technology require the restructuring of education programs and the development of a new educational approach that will help students adapt to the age of digitalization we live in. Today's generation has become a generation that has shaped the age, and has become a generation that has already passed the stage of keeping up with the times (Candelaria, 2023). Therefore, new approaches are emerging within the scope of the requirements of the digital age, and technology is effective both as a tool and as a goal in the learning-teaching process (Naycı, 2020, pp. 53-54). The ability of today's students to evaluate and construct knowledge by using technologies in professional and academic contexts is extremely important for them to have a successful career. However, educators have an important role in the application of digital technologies in school life. Educators are expected to be able to choose the most appropriate practices among the various options available in the teaching and learning process and to have the skills to apply them in a meaningful way in the classroom environment. (Braun, März, Mertens, & Nisser, 2020).

The demand for natural resources is increasing on a global scale with the increase in the world population and the deterioration of the natural balance. Countries and societies take measures such as raising qualified manpower and globalization in order to create strong economies and meet new raw material and market demands (Öztaban, 2020). Technological advances, economic crises, changes in workforce structures and social trends require institutions to adapt to change (Argon, 2020, p. 281). Educational institutions, on the other
hand, should adapt to change with a higher priority compared to other systems (Küçüksüleymanoğlu, 2021, p. 69). In the globalizing world, education systems have to adapt to the ever-evolving process and make plans considering the future conditions. For this reason, it has become inevitable for schools to adapt to change and adapt quickly in a rapidly changing world (Parlar, 2014).

Currently, schools have the task of creating an "Information Society" (Özden, 2020, p.60). Education systems have to use technological developments to be contemporary and meet social and individual needs; otherwise, it is clear that they will not be able to meet these requirements (Alkan, 2011). Successfully integrating technology into education is associated with effective school leadership (Lindqvist & Pettersson, 2019). Since schools have a dynamic structure, it is important to provide students with the knowledge and skills required by the age and to adapt to change. Managing this change process is the responsibility of school leaders (Şişman, 2018, p. 137). Leaders who follow the changes in education, do not ignore and apply these innovations in their schools are needed in the digital age (Bilgic, 2019). Therefore, school administrators should act as instructional leaders and visionary leaders in the digital age and be able to use technology for management. It is also an important issue that school administrators should focus on technology applications at school (Uğur & Koç, 2019).

The International Association for Technology in Education, known as ISTE, has developed several standards in the United States for education administrators to become technology leaders. According to these standards, school administrators should adopt the principle of equality of teachers and students in accessing technology, and strongly emphasize the importance of safe, ethical and legal technology use. School administrators should act as visionary planners and ensure that technology is used in schools to increase student success. In addition, principals and assistants should establish teams to create and maintain a technology culture at school and keep up with changes and trainings in the field of technology (Çoban, 2021).

Artificial Intelligence (AI) is the collection of computer programs or systems that mimic or surpass human intelligence. Artificial Intelligence can perform operations similar to human intelligence, such as analyzing data, learning and making decisions. The purpose of this technology is to automate and speed things up that people may not be able or want to do. It can be used in different fields such as Artificial Intelligence, audio and visual recognition, machine learning and neural networks. Artificial intelligence can be used in various ways in learning and teaching processes in schools. For example, artificial intelligence algorithms can provide students with customized learning experiences by analyzing their learning levels. In
addition, AI can help teachers evaluate performance and provide more effective feedback to students.

According to Kebritchi and Hirumi's (2018) research, primary school administrators can offer many opportunities for the use of artificial intelligence technologies in educational processes. For example, AI-based learning systems can offer learning materials customized to students' learning styles and needs. In addition, AI-supported teaching materials can be used to monitor students' learning performance and provide feedback. The integration of artificial intelligence with the education sector is not yet advanced compared to other fields. However, considering the pace of development in this area, it is expected to affect education stakeholders in the near future. It is possible that this influence may bring advantages to the stakeholders as well as disadvantages. According to the examinations made, when the artificial intelligence studies in the field of education are examined, it is seen that it is the field where the most studies and improvement are made on student and learning issues. It is possible for these studies to make progress among educational organizations, parents and teachers (Çetin, 2021).

Metaverse can be defined as a virtual world and can be defined as a platform where users gain more control than their real-life experiences, interact in digital environments or create virtual assets. Metaverse can be thought of as a medium where social media, games, e-commerce and other digital applications converge. It is important for decision makers to examine the main issues and educational potential of the Metaverse, and to analyze the relevant outputs in the national and international literature. While studies in Turkey generally focus on virtual platforms such as virtual reality, augmented reality and Second Life, studies directly on Metaverse are few (Karabatak, 2020; Uzun Hazneci, 2019; İlic, 2013; Can, 2012). Towards the educational world of Metaverse One of the first shortcomings in Turkey occurs in augmented reality tools due to the inadequacy of qualified software with Turkish language support. This is one of the fundamental dimensions of the Metaverse (Soylu, 2019).

As an important development, in the field of Metaverse, technology devices are being downsized and made naturally pluggable. This development enables people to interact with augmented reality in physical environments, which means a complete change in subjects such as classroom and pedagogy (Sipahioglu and Demircelik, 2021). In the future, with the support of technological tools such as hololens, a living order will be created that will offer the opportunity to attend meetings even while walking on the road. This development is capable of changing all teaching processes and environments, including literature and geography courses. Thanks to Metaverse, high-budget prices in education can be minimized by creating a digital twin of the real world. For example, instead of building a new planetarium, it may
make more sense to create the same in a digital world, and this can be done at a cost of 1% (Damar, 2021).

The aim of this study is to determine the duties of primary school administrators in the digital transformation process, considering all this information, and to contribute to the effective use of digital technologies by these administrators and to the development of students' digital literacy skills. In order to achieve this aim, answers were sought for the following sub-objectives.

Sub-purposes:
1. What are primary school administrators' views on the use of artificial intelligence technology in schools?
2. What are the primary school administrators' views on the use of metaverse technology in schools?
3. What are the views of primary school administrators on the creation of an education model using artificial intelligence technologies in schools?
4. What are the primary school administrators' strategies on how to use technological education tools in schools?
5. What are the views of primary school administrators about the school's evaluation of the digitalization age and the process of adapting to this trend?

Method

2.1 Model of the Research

This research, which examines the duties of primary school administrators in digital transformation, was carried out using qualitative data. In the research, the tasks of the participants in digital transformation, their attitudes towards artificial intelligence and the metaverse, how they are with technology, and how they carry out technology leadership and digital leadership were examined.

Qualitative research is a type of research that is carried out in the natural environment and focuses on the holistic emergence of perceptions and events through data collection methods. The main purpose of qualitative research is to deal with the researched subject in a detailed, direct and realistic way and to analyze the opinions, experiences and documents of the research participants in as much detail as possible. Handling the obtained data in detail
and comprehensively is of great importance for the validity and reliability of the research (Creswell & Poth, 2018).

2.2 Working Group

In this research, state and private primary schools that serve and contribute to education and training in the Turkish Republic of Northern Cyprus were randomly selected and the universe of the research consists of 16 school administrators (Principal, Assistant Principal) working in these schools.

2.3 Data Collection

First of all, an ethics report was obtained for the research by applying to the Near East University Research Ethics Committee. Then, necessary permissions were obtained from the Ministry of National Education and Culture of the Turkish Republic of Northern Cyprus, affiliated to the Department of Primary Education, to collect data from the primary schools where the research would be conducted. Then, data collection was started from the school administrators included in the study.

The participants were presented with an information form and an informed consent document, and it was explained that the data obtained would only be used in this study and that the research would be conducted in accordance with the principles of confidentiality.

2.4 Analysis of Data

The analysis of the obtained data was made with the content analysis method. Content analysis is a type of analysis that is widely preferred and applied in qualitative research. This method includes the process of defining the data, collecting it under certain themes and interpreting it. In qualitative research, themes are determined by coding the data, and then the codes and themes are arranged to define and interpret the findings (Yıldırım & Şimşek, 2018).

The researcher gave the participants a code name (K1, K2). The data obtained during the research were reflected in the research without making any changes.
2.4.1 Reliability

In qualitative research, there are some precautions to be taken in terms of internal and external reliability. These measures aim to enable other researchers to use similar strategies by clearly stating the strategies used by the researcher. These strategies include the methods used at different stages of the research (Yıldırım & Şimşek, 2018).

2.4.2 Internal Confidence

In accordance with some of the strategies proposed by Miles and Huberman (1994) regarding internal reliability, the researcher took the necessary precautions. These measures include:

1. The research questions are clearly and beautifully expressed.
2. The position of the researcher was clearly defined during the research process.
3. The results of the research are consistent with the obtained data.
4. The researcher's perspective and attitude towards research are clearly defined.
5. The identities of the participants and the institution they work for are kept confidential.
6. At the stage of data analysis, prejudices, misunderstandings and wrong data were examined and invalid data were removed.

2.5 External Confidence

Some measures were taken to ensure external reliability in the research. The schools and names of the teachers used as data sources were kept confidential and their characteristics related to the research were defined in detail. Secondly, the details of the time and environment in the research process are explained. Third, the conceptual framework and assumptions are presented in detail. Finally, the methods used in the data collection and analysis process, how the interviews were conducted, the questions asked in the interview, the method of document analysis and how the results were combined and presented were clearly stated.
Results

3.1 First Dimension: Thoughts on the Use of Artificial Intelligence Technology in Schools

As can be seen in Table 1, according to the opinions of the individuals, the view "It facilitates the preparation of exams and lecture notes" within the theme of 'Thoughts on the use of artificial intelligence technology in schools' 3 individuals, It supports the learning processes of the students 1 individual, It facilitates the admission of students with different languages to school 1 individual, The opinion that it accelerates the learning process of a new language 1 individual, The opinion that it helps to provide personalized education 1 individual, The opinion of informing teachers about artificial intelligence 2 individuals, The opinion of strengthening computer laboratories and increasing technological tools 1 individual, and the opinion that it provides assistance to applied lessons is seen by 4 individuals. Due to the nature of qualitative analysis, when we carefully, beautifully and thoroughly analyze the answers given by the participants, we observe that primary school administrators have various views on how artificial intelligence can be used in schools.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Stakeholder Comments(n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides convenience in preparing exams and lecture notes</td>
<td>3</td>
</tr>
<tr>
<td>Supports students' learning processes</td>
<td>1</td>
</tr>
<tr>
<td>Facilitates the admission of students with different languages to school</td>
<td>1</td>
</tr>
<tr>
<td>Speeds up the process of learning a new language</td>
<td>1</td>
</tr>
<tr>
<td>Helps deliver personalized training</td>
<td>1</td>
</tr>
<tr>
<td>Informing teachers about artificial intelligence</td>
<td>2</td>
</tr>
<tr>
<td>Strengthening computer laboratories and increasing technological tools</td>
<td>1</td>
</tr>
<tr>
<td>Provides assistance with hands-on lessons</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1: Thoughts on the use of artificial intelligence technology in schools
Source: the authors

Some of the participants' opinions are given below.

“Practical examples can be made.” K3
“It will be used in all areas of education.” K5
“Artificial intelligence can be used in schools as long as information technologies are active in all courses with a holistic approach.” K7
“Instructional and practical applications…” K8
“Thanks to artificial intelligence, it will be easier for us to admit students with different languages to school.” K9
“First of all, the necessary financial resources should be provided equally to all schools by the Ministry of National Education, and then education and training can be made simpler with artificial intelligence.” K11
“It can assist teachers in preparing lecture notes.” K13
“It can ensure that the lesson preparation is done before the lesson starts” K14
3.2 Second Dimension: Thoughts on the Use of Metaverse Technology in Schools

As seen in Table 2, according to the opinions of the individuals, the opinion that online education is beneficial, which is included in the theme of 'Thoughts on the use of metaverse technology in schools', 4 individuals. The opinion that it can distract from reality 3 individuals, The opinion that it is not necessary 3 individuals, There may be problems due to school budget and economy 3 It is seen that the opinion of the individual, It facilitates learning by experiencing, 3 individuals, the opinion that it is necessary to create virtual environments and computer labs was reported by 2 individuals and the opinion that it should be expanded was reported by 1 individual. Due to the nature of qualitative analysis, when we carefully, beautifully and thoroughly analyze the answers given by the participants, we observe that primary school administrators have a wide variety of thoughts on the use of metaverse technology in schools.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Stakeholder Comments(n)</th>
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<tbody>
<tr>
<td>Benefits online education</td>
<td>4</td>
</tr>
<tr>
<td>Can distract from reality</td>
<td>3</td>
</tr>
<tr>
<td>Not required</td>
<td>3</td>
</tr>
<tr>
<td>There may be problems arising from the school budget and economy.</td>
<td>3</td>
</tr>
<tr>
<td>Facilitates learning by doing</td>
<td>3</td>
</tr>
<tr>
<td>It is necessary to create virtual environments and computer labs</td>
<td>2</td>
</tr>
<tr>
<td>It should be expanded</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2: Thoughts on the use of metaverse technology in schools
Source: the authors

Some of the participants' opinions are given below.

“I welcome the strengthening of the economic structures of schools and the use of metaverse technology. Especially in science and art classes, it would be great for children to be educated in three-dimensional environments by creating rooms according to their particular interests and learning by experience.” K1

“It enables children to learn by doing.” K6

“It can be beneficial in online education.” K11

“I think it is necessary to go to a serious budget increase for this. A virtual environment can be created in schools and seminar-style organizations can be organized.” K15

“There's no need.” K17

3.3 Third Dimension: Thoughts on Creating an Education Model Using Artificial Intelligence Technologies in Schools

As seen in Table 3, some of the opinions of the individuals included the view that virtual and applied courses can be given weight in the theme of 'Thoughts about the creation
of an education model using artificial intelligence technologies in schools 4 individuals, 3 individuals, The opinion that distance education can benefit 3 individuals, An education model where the workload is reduced. It is seen that the opinion of "what I see in the lessons is quite interesting and excites me" was reported by 4 individuals, and the opinion of turning to interesting subjects was reported by 6 individuals. Due to the nature of qualitative analysis, when we examine the answers given by the participants carefully, beautifully and analyze in depth, we observe that the ideas of primary school administrators on how to create an education model using artificial intelligence technologies in schools are gathered in 4 different common denominators.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Stakeholder Comments(n)</th>
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</thead>
<tbody>
<tr>
<td>Virtual and applied lessons can be emphasized</td>
<td>4</td>
</tr>
<tr>
<td>It can benefit from distance education</td>
<td>3</td>
</tr>
<tr>
<td>Can create a training model where the workload is reduced</td>
<td>3</td>
</tr>
<tr>
<td>Focus on interesting topics</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 3: Thoughts on creating an education model using artificial intelligence technologies in schools
Source: the authors

Some of the participants' opinions are given below.

“Since it will reduce the workload, we can deal with the students better one-on-one and focus on applied lessons.” K11
“It can provide the opportunity to work efficiently. In this way, their success increases. Therefore, benefiting from artificial intelligence can be good for education.” K12
“Trainings based on virtualized three-dimensional simulation can be created using artificial intelligence technologies.” K13
“It can help teachers where teachers get stuck and provide students with a complete lesson.” K15
“Remarkable events can be organized as in distance education.” K16

3.4 Fourth Dimension: Strategies for the Use of Technological Educational Tools in Schools

As can be seen in Table 4, the opinion of 9 individuals to develop their laboratory with computers, which is included in the theme of 'Strategies for the use of technological educational tools in schools', according to the opinions of individuals, the opinion of developing teachers in terms of technology 3 individuals, and the opinion that technological tools should be complete for both teachers and students 4 individuals appears to have been reported by Due to the nature of the qualitative analysis, when we examine the answers of the participants carefully, beautifully and analyze in depth, we observe that the leading common
stakeholder of the primary school administrators’ strategies on the use of technological educational tools in schools is the development of computer laboratories.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Stakeholder Comments(n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing computer labs</td>
<td>9</td>
</tr>
<tr>
<td>Developing teachers in terms of technology</td>
<td>3</td>
</tr>
<tr>
<td>Technological tools need to be complete for both teachers and students</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4: Strategies for the use of technological educational tools in schools
Source: the authors

Some of the participants' opinions are given below.

“First of all, teachers who will use these tools should be informed. The use of these tools should be taught to ensure the responsibility of cleaning and control. 2. We must bring these tools together with every child in the school and let the importance of technology live.” K1
“IT is necessary to have enough computers in computer laboratories to support the number of students in each class.” K11
“Computer laboratories should definitely be given importance. The best technological tools for teachers and students should be taken to the school within the possibilities.” K12
“I think the tools should be fully distributed to the entire teacher group.” K15

3.5 Fifth Dimension: Thoughts on How the School Evaluates the Era of Digitalization and How It Tries to Adapt to This Trend

As can be seen in Table 5, according to individual opinions, within the theme of 'Thoughts on how the school evaluates the digitalization age and how it tries to adapt to this trend', the opinion that innovations should be followed and adapted to the modern age is 8 individuals, First of all, teachers need to improve themselves and then students should be conscious 2 It is seen that the opinion of 3 individuals is that it is important to develop myself and reflect to the teachers, The opinion that computer teachers should be assigned in this regard is reported by 2 individuals, and the opinion of "We are trying to improve ourselves" is reported by 3 individuals. Due to the nature of the qualitative analysis, when we examine the answers given by the participants carefully, beautifully and analyze in depth, we observe that the primary school administrators adopt the idea that every administrator should improve himself and are aware of this, since it is aimed to adapt to the modern age on the basis of the school’s evaluation of the digitalization age and adapting to this trend.
Some of the participants' opinions are given below.

“It follows continuous developments to adapt to the digital age.” K1
“Working on providing the necessary technological devices.” K6
“I send computer teachers to continuous in-service training. They also train teachers.” K10
“I focus on improving myself first and then I try to adapt it to the school as much as I can.” K11
“As the management, we ourselves try to catch this age and instill it in children as much as possible.” K12
“Since we do not have enough resources to move into the digitalization age, we are trying our best to adapt to the digitalization age individually. As an individual, I am improving myself to adapt to new technologies.” K13
“We try to fit into the modern era within our budget. We are trying to provide the necessary technologies and necessary tools to our teachers and students as much as possible.” K15

3.6 Word Analysis

In this section, there are word analyzes based on the findings obtained as a result of the data. When the data of the research is examined, it is seen that there are 7 key words that stand out for the research. These words; It is seen that there are “In Schools”, “Students”, “Learning”, “Metaverse”, “Digital”, “Budget” and “Ministry”.

When we examine the word “in schools”, we observe ideas about how the metaverse and artificial intelligence can be integrated into schools and how teachers can adapt to it. We observe that if the necessary technologies are provided to schools, students can adapt to the modern age in the best way. We see that school administrators give the necessary help and support to teachers and students, and we observe that they have started to take innovative steps for digital transformation.

When the word "to students" is examined, we can understand the views of school administrators about this innovative and modern age we live in. We observe the idea that it is possible to enrich the course content of students with technological tools and that it will contribute greatly to the development of digital skills. We observe that administrators adopt the idea that if used correctly, artificial intelligence will help to explain the lesson completely, help teachers when they get stuck, and improve students' creativity levels.
When we examine the word “learning”, we observe the ideas that technological tools and artificial intelligence are important for education and training, accelerate learning and make learning easier. It is observed that one of the biggest advantages of artificial intelligence, which is expected to benefit students at various stages of education and training, accelerates the learning process. When the word "metaverse" is examined, we observe that school administrators prefer this virtual world in online lessons and that the metaverse universe is the biggest helper of teaching classes as if they are in the classroom in case of possible pandemic situations or teacher-student illnesses. We observe that the administrators have adopted the idea of increasing the school budget.

When the word “digital” is examined, we observe that school administrators carefully choose the technological education tools to be taken into schools and they advocate the view that children can improve themselves thanks to these tools. He observes that the administrators, who advocate the importance of knowing how to use all these tools to adapt to the age, want to bring themselves and teachers to a good level in the use of all technological tools before students, and thus aim to be the biggest supporter of students in digital transformation, and while doing all this, they also put an end to privacy and security principles. We observe that they attach great importance to it.

When the word "budget" is examined, we observe that schools do not have the necessary budget for technological equipment, artificial intelligence and metaverse, and school administrators argue that the Ministry of National Education should provide the necessary assistance to schools in this regard.

When the word "Ministry" is examined, we observe that the ministry organizes courses and provides training in the process of adapting school administrators and teachers to the modern age, and in this way, all teachers try to improve their technology skills and prepare them for digital transformation in the best way possible. We observe that school administrators expect extra budget from the ministry for all necessary technological tools and equipment.

**Conclusion and Recommendations**

**4.1. Conclusion**

Many issues on the importance of digital transformation in the education system have been discussed. The Ministry of National Education can organize activities to increase the digital competencies of school administrators and they can easily improve their personal
development by using digital tools. Educational institutions can organize various activities to improve students' digital skills. In addition, school administrators and teachers can interact with students using digital tools. Artificial intelligence technologies can encourage students to learn according to their personal skills and interests, contribute to their learning processes by helping them better understand the subjects, increase their exam success and provide many benefits such as providing more efficient study opportunities. However, while using these technologies, ethical values should be prioritized and issues such as the security and confidentiality of student data should be considered. School administrators and education professionals should create and continuously monitor strategies, considering the potential benefits and possible harms of these technologies, and adjust them by intervening when necessary. In this way, it is thought that digital transformation can have a positive effect on the education system and contribute to the preparation of students for a better future.

There are important issues that primary school administrators should consider about how to use artificial intelligence technology in schools. Taking these concerns into account, schools need to conduct a comprehensive risk analysis before using AI technology. This analysis can help determine how the use of AI technology in schools can be effectively managed by addressing concerns such as student privacy, security, and the replacement of teachers. In addition, schools need to consider the costs of using metaverse technology and decide accordingly. It is extremely important for school administrators to be conscious during the use of technology and to financially support technological education tools. It is advocated that this financial support should be realized with the efforts of the Ministry of National Education, the European Union and school-parent unions. Studies to improve students' learning processes should be carried out together with ensuring the correct use of technology and taking necessary precautions to protect security and privacy.

As a result of the researches, it has been determined that the leadership and digital leadership behaviors of school principals are quite effective. Sources such as Görgülü, Küçükali and Ada (2013, p. 68), Yahşi (2020, p. 244) and Doğan (2018, p. 62) state that school principals have high and very high self-efficacy levels in technology leadership. Banoğlu et al. (2016), Gürsel (2020) and Hamzah et al. (2021) also emphasized that the technology leadership behaviors of primary school principals and assistant principals are at a high level. These studies support the findings of this study. The results obtained present us that the digitalization and digital transformation studies (Mebbis, E-school, ÖBA, EBA etc.) that started and continued in the Turkish education system since the 2000s have been successfully adopted by school principals. Sheninger (2014, p. 46) also emphasizes the importance of
digital leadership in order to adapt to the changing student profiles of schools and to provide the necessary skill sets.

According to the findings of this research, school principals and assistant principals collaborate with educators while determining technology-related goals and objectives. This result also supports the idea in the literature that the main condition for managers to be able to lead more effectively in technology is to set technology-related targets by ensuring the participation of educators (Can, 2008; Anderson & Dexter, 2005; Chang, Chin & Hsu, 2008; Dawson & Rakes, 2003; Şişman-Eren, 2010). This result may suggest that school administrators are willing to use new technologies in educational environments, strive to improve the quality of education, and wish teachers to play an active role in this process. In line with what was stated by Sibley and Kimball (2004), the setting of applicable technological goals has a direct impact on the technology leadership of school principals and assistant principals and the success of the integration phase of technology into all activities in schools. However, it can be said that having technology goals of schools is not enough to achieve the expected success from schools in digital transformation.

Ertmer and other researchers (2002) accepted technology leadership as a role with the ability to set technological goals shared with all staff, and when setting these goals, administrators work with external stakeholders (parents, other school administrators, senior units, etc.) emphasized the necessity of cooperation. Şişman-Eren (2010) determined that while setting these goals, administrators cooperate only with internal stakeholders and do not consider the views of external stakeholders. However, studies in the literature show that more realistic goals are set when school administrators are highly involved in the technological decision-making process (see Thomas & Knezek, 1991; Jewell, 1998-1999; Costello, 1997). In line with these findings, it is possible to say that school administrators will come together with teachers and external stakeholders to create more effective technology targets. However, it should be noted that the involvement of external stakeholders in the process of setting technology goals of school administrators was not taken into account in this study. Future research should examine the impact of technological goals set with the participation of external stakeholders on the inclusion process and the effective use of technology.

It was emphasized that school administrators should evaluate the problems that teachers encounter while using information technologies and observe their technology competencies (Kearsley & Lynch, 1992; Anderson & Dexter, 2005). Therefore, it is important for school administrators to organize in-service training activities that they and their staff can benefit from (see Flanagan and Jacobsen, 2003; Cope and Ward, 2002; Oubre, 2007; Macneil...
and Delafield, 1998). A report published by the National Commission on Teaching and the Future of America in 2003 states that teachers experience loss of professional knowledge in the first five years (14%, 24%, 33%, 40%, and 46%) because they cannot maintain the knowledge they have gained during their university education at their schools. Therefore, it can be stated that in-service training is extremely important for lifelong learning. In Yurdusev's (2006) study, it was determined that school administrators did not consider information technologies sufficient, and the rapid development of technology and workload were cited as the reason for this. It has also been emphasized that the participation of school administrators in in-service training will contribute to the development of effective technology policies and to bring a different perspective to the inclusion process (Daniel & Nance, 2002). In Macaulay's (2009) study, it was determined that administrators who benefited from these in-service trainings intend to be technology leaders, are encouraged, encouraged, and feel more competent to set an example for teachers by supporting the use of technologies that have just entered or will enter our lives.

It has been emphasized in many studies that teachers as well as administrators should have technological knowledge and skills in order to successfully integrate technology into educational environments (Akbaba-Altun, 2006; Oubre, 2007; Cope & Ward, 2002). When the literature is examined, it has been determined in many studies that educators do not have enough skills and knowledge about integrating new technologies into educational environments. The reason for this situation is that the undergraduate education is not satisfactory (Doğan & Seferoğlu, 2015; Duran & Fossum, 2010). In a study conducted by Duran and Fossum (2010), it was determined that pre-service teachers' university education helped them acquire basic knowledge and skills, but they did not have sufficient knowledge and skills about how to use technological tools effectively. For this reason, Dexter and Riedel (2003) emphasize that candidate educators should be mastered in the use of computer technologies in educational environments with new approaches during their education period. In addition, these difficulties encountered in using technology effectively emphasize the importance of instructors' participation in in-service training in their professional lives. It has been revealed that the classroom teachers who have received in-service training on educational technology and material use use more technological tools in their lessons compared to the classroom teachers who do not receive this training, and it has been determined that they have the most difficulties in hardware and software knowledge (Hall, 2006).
4.2 Suggestions

- School administrators should renew the technological infrastructure of their schools and follow the latest technological developments.
- School administrators should support the use of digital platforms in education and provide students with internet access.
- School administrators should train their teachers on teaching using digital tools and using e-learning platforms.
- School administrators should renew the content in their schools and present the most up-to-date information-based content.
- School administrators should take the lead in recognizing and monitoring students' learning progress.
- School administrators should use secure and up-to-date technologies for the security of students' data.
- School administrators should communicate regularly and effectively with students, teachers and parents using digital communication tools.
- The Ministry of National Education can organize activities to investigate the digital competences of school administrators at the local level.
- School administrators can focus on training and constantly updating themselves in this area to improve their digital competence level.
- The Ministry of National Education can prepare regular publications for school administrators to learn about the features and use of new technologies and deliver these publications to them.
- In order to solve the problems that occur during the use of computer technologies in schools, technical units should be established to provide support to the administrators.
- School administrators can inform parents about the use of digital tools.
- School administrators should be aware of the potential for the use of artificial intelligence technologies in their schools and should be ready to use these technologies.
- School administrators should understand how artificial intelligence technologies can contribute to learning processes and use these technologies to facilitate learning.
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Submetido em: 21.08.2023
Aceito em: 20.09.2023