Journal of Learning and Teaching in Digital Age, 2024, **9**(1), 102-114
https://dergipark.org.tr/en/pub/joltida
ISSN: 2458-8350 (online)

Research Paper

Digital Competence of Educators in Turkey According to European Digital Competence Framework

Zafer Kuş*[a], Hilal Mert[b]

[a](ORCID ID: 0000-0002-7309-8833), Kırşehir Ahi Evran University, Turkey, h.mert@ahievran.edu.tr
[b](ORCID ID: 0000-0002-4371-8114), Kırşehir Ahi Evran University, Turkey, zaferkus@gmail.com
*Corresponding author

ARTICLE INFO

Received: 24 May 2023
Revised: 15 October 2023
Accepted: 16 October 2023

Keywords:
Digital Competence
European Framework
Digcompedu
Educators
Turkey

doi: 10.53850/joltida.1301592

ABSTRACT

Nowadays, it is not common to come across sectors that can work and succeed without using information technology (IT). IT has now become a part of organizations' management and strategic decision-making mechanisms. Therefore, organizations make serious investments to develop software and system infrastructures and transfer business processes to digital environments such as cloud technologies. So, they gain opportunities of spreading their business activities to wide stakeholders and customers and being business resilient. Here it is essential to provide assurance that an organization evaluates, develops, implements, maintains, disposes of its IT systems and manages life cycle of all information and information technology systems properly on all physical and logical environments. However, the most important matter is that an organization's objectives are met by the management practices of its information systems. While organizations carry out their digital transformation at a dizzying speed, organizations should be protected from material and moral damages such as loss of money, loss of commercial confidential information, loss of reputation by protecting the confidentiality, integrity and accessibility of the information assets they own and also comply with legal legislations such as the protection of personal data and intellectual property rights. In order to achieve this, organizations benefit from one or more frameworks, standards or directives that are suitable for their own structures and needs, separately or by integrating them. However, the most important point in this transformation process is the transition of organizations from IT management understanding to IT governance. In other words, IT has now become a part of the strategic decision-making mechanism by rising from the level of support tool to carry out business processes in organizations. When we search the academic literature, frameworks and standards, it is seen that the key elements of IT governance are structures, processes and relational mechanisms. If these three components are set up correctly and fit the organization, it can be assured that IT aligns with and supports the objectives of the organizations and that effective IT governance is achieved in every kind of organizations. In this research, databases such as Web of Science, IEEE, and SCOPUS are scanned and found articles are reviewed in order to make a literature review on IT Governance Mechanisms and Frameworks. Results are evaluated and discussed. By the way, suggestions for further studies were made and advanced researches were shed light on.

INTRODUCTION

In the 21st century, the use of digital technologies has become widespread and these technologies have become an integral part of life in every field. In 2021, "Digital 2021: Global Outlook Report" was published on the digital data of the world countries. According to the report, 66.6% of the world's 7.83 billion population in 2021 are mobile phone users, 59.5% are internet users and 53.6% are social media users (We Are Social, 2021). There is no doubt that the unstoppable progress of digital technologies has transformed many areas of human endeavour. The use of the Internet has revolutionized concepts of interaction; the empowerment of information has inevitably led to changes in society's outlook that have had and will continue to have a major impact beyond being significant, and with it changes in trends that are accelerating (Levano-Francia, Sanchez Diaz, Guillén-Aparicio, Tello-Cabello, Herrera-Paico & Collantes-Inga, 2019).

Rapid changes in information technologies have required educators and researchers to follow technological developments and made the integration of new technologies into learning and teaching processes as in other fields. Technology integration is a multidimensional and dynamic process involving many variables such as government policies, teachers, students, school management, technical infrastructure and curricula. It is the teacher who will employ technology in the learning-teaching process and realize the technology integration process (Avcı, Kula, & Haşlaman, 2019).

Internationally, various standards have been established to determine teachers' skills/competences related to the use of technology. For example, The ISTE Standards (2021), internationally serve as a framework for innovation and excellence in learning, teaching and leadership. they provide a holistic and comprehensive guide to transforming systems to transform the lives of our students. this

guide specifies many competences related to the use of digital tools, such as critically organising a variety of resources, structuring digital knowledge, protecting intellectual property with digital tools. UNESCO (2018) has also published a competence framework for teachers as a tool to provide guidance on the use of digital tools in the professional development of pre-service and in-service teachers across the education system. The framework argues that teachers should use teaching methods appropriate to changing information societies. It emphasizes that students should not only acquire knowledge through their school subjects but also understand how ICT as a tool can generate new knowledge. OECD (2023), Teaching for the Future: Global Inclusion, Sustainability and Digital Skills, outlines the challenges and key trends for teaching and schools and provides proposals for improving education standards to ensure that learning meets the needs of all learners, regardless of their background. One of the foci of these recommendations is the digital skills of teachers. The report emphasises the need for teachers to bring technology into their lessons.

In the curricula implemented in 2018, MoNE (Ministry of National Education) explains the eight competencies identified in the Turkish Qualifications Framework under the title of competencies. The aim of these competences is to provide students with the skills they will need in their personal, social, academic, and business lives at both national and international levels. The fourth of these competences is Digital Competence. In the curriculum, this competence is defined as ": This competence covers the safe and critical use of information and communication technologies for work, daily life and communication. This competence is supported by basic skills such as using computers for accessing and evaluating, storing, producing, presenting and exchanging information, as well as participating in common networks and communicating via the internet." (MoNE, 2018, p. 5). In order for students to achieve digital competence, it is important that they learn digital technologies and use them repeatedly in their lives. Considering that today's young people are born into a digital world and are digital natives, it is thought that it will not be difficult for students to adapt to technology and use it in their daily lives. At this point, it is important that educators, who are digital immigrants who learn digital technologies later, adapt to this process and guide students effectively in learning and teaching processes. In this context, the curriculum expects teachers to ensure the integration of technology with educational processes.

Digital competences can be expressed as a concept that creates various research areas in the light of new technological developments in the field of information communication technologies. Its great importance in the field of its application to educational technology is that its spectrum of action encompasses both learning, research, leisure and social, as well as various reflections among others (Levano-Francia et al., 2019). The ability to interact competently with technology has become a key goal in the professional development of educators. They should not only have the ability to find, create and use digital teaching and learning resources, including for assessment purposes, but also know how to facilitate the development of digital competence in their students, especially those who will be the teachers of tomorrow. Thus, the resources and opportunities available to educators in their working environments are of key importance (Alarcón, Del Pilar Jiménez & de Vicente-Yagüe, 2020). In this context, the European Commission has prepared the European Framework for Digital Competence of Educators (DigCompEdu). This framework shows how it can contribute not only to setting formal goals or standards for teachers' digital competence development, but also to engaging teachers in the reflective process of understanding their own competence levels and professional development goals (Caena & Redecker, 2019).

According to Redecker (2017), the European Framework for Digital Competences of Educators (DIgCompEdu) details educator-specific digital competences in six dimensions. When applied to the context of school education, Professional Engagement describes teachers' effective and appropriate use of technologies for communication and collaboration with colleagues, students, parents and external parties. The core of the framework is represented by dimensions 2 and 5, where technologies are integrated into teaching in pedagogically meaningful ways. The second dimension, digital resources, focuses on the selection, creation, modification and management of digital educational resources. The third dimension, teaching and learning, is concerned with planning, designing and organizing the use of digital technologies in teaching practice. The fourth dimension, assessment, addresses the concrete use of digital technologies to assess student performance and learning needs, comprehensively analyses available performance data, and provide targeted and timely feedback to students. The fifth dimension, empowering learners, is the domain of meeting learners' needs and enabling them to actively develop their learning journey. Facilitating students' digital competence is the last dimension, which emphasizes that a digitally competent teacher should be able to promote information and media literacy and integrate it into specific activities to enable digital problem solving, digital content creation and the use of digital technology for communication and collaboration. DigCompEdu also provides a scale of the expressed competences. This scale enables the authorities to analyze the digital competence status of educators, identify deficiencies and offer solutions accordingly (Toker, Akgün, Cömert, & Edip, 2021).

The global pandemic, which has affected the whole world in the last three years, has revealed the importance of having digital competence in many areas, especially in the field of education. With the effect of technological developments continuing unabated, it is seen that studies on the digital competencies of educators are focused on. It is thought that the digital restructuring of the lessons will be ensured by the teachers' achievement of digital competence and that it will pave the way for children born into the digital world to benefit effectively from the education and training processes. There is a variety of research investigating the digital competence levels of teachers in many countries (Spiteri & Rundgren, 2017; Lucas, Bem-Haja, Siddiq, Moreira, & Redecker, 2021; Prtljaga & Savić, 2017; Cabezas-Gonzalez, Casillas-Martín, Sanches-Ferreira & Teixeira Diogo, 2017; Alarcon, Del Pilar Jimenez, de Vicente Yagüe, 2020; Antonietti, Cattaneo & Amenduni, 2022; Napal Fraile, Peñalva-Vélez, & Mendióroz Lacambra, 2018;

Lucas, Dorotea, & Piedade, 2021; Cabero-Almenara, Gutiérrez-Castillo, Palacios-Rodríguez, & Barroso-Osuna, 2020). The general focus of these studies is to examine the digital competence of teacher candidates and teachers in various branches in terms of professional development and certain variables. Scale development studies have been conducted in different countries for these competences. However, there are a limited number of studies investigating the digital competence levels of teachers in Turkey through the DigCompEdu framework (Keskin & Yazar, 2015; Toker, Akgün, Cömert, & Edip, 2021;Yılmaz & Toker, 2022; Yılmaz, Aktürk, & Çapuk, 2021). This research is important in terms of evaluating the digital competences of educators in Turkey according to an international framework. It is hoped that the research will contribute to the field in this respect. In this research, three different research questions were focussed. **RQ1**: What are the digital competence levels of educators in different disciplines in Turkey according to the European Union Digital competence framework? **RQ2:** What are the factors affecting the digital competence levels of educators? **RQ3:** What is the teachers' experience of digital competences in the six different areas defined in the European Framework?

METHOD

Research Design

Mixed method was used in the research. In mixed method studies, qualitative and quantitative methods are used together. The aim here is to complement the weaknesses of one of the methods used with the strengths of the other method. Thus, the validity and reliability of the data obtained by both methods are increased (Creswell & Plano Clark, 2020). Explanatory Sequential Design, one of the mixed method designs, was used in the study (see Figure 1). In this design type, quantitative data are usually collected first and quantitative and qualitative methods are combined in the interpretation phase of the study. The goal of the explanatory sequential design is to utilize qualitative results to help explain and interpret the findings of a primarily quantitative study. Qualitative data collection can be used to examine these results in more detail (Creswell, 2017). In this direction, the survey model was preferred in the quantitative dimension of the research and the case study was preferred in the qualitative dimension.

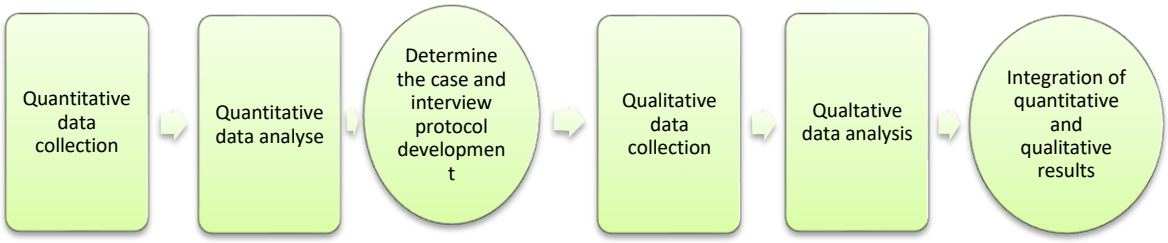

Figure 1. The explanatory sequential mixed methods design (Creswell ve Plano Clark, 2020)

Study Group

Purposive sampling method was used in the study. Purposive sampling allows in-depth research by selecting information-rich situations depending on the purpose of the study (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2020, p. 92). A total of 212 teachers (120 female and 92 male) participated in the study. Quantitative data were collected through face-to-face interviews or Google forms from teachers working in big cities (Istanbul, Ankara, Antalya, Samsun, Van) and small cities (Kırşehir, Ağrı, Şanlı Urfa, Kırıkkale). The data were collected in the spring term of 2021-2022 academic year. Personal information about the participants is presented in Table 1.

Table 1. The sample structure

Socio-demographics	***f***	**%**	**Socio-demographics**	***f***	**%**
Gender			***Degree***		
Female	120	56,6	Bachelor	167	79
Male	92	43,4	Master	45	21
Seniority			***Branch***		
0-5 years	36	17,0	Classroom teacher	44	20,8
6-10 years	35	16,5	Social Studies	40	18,9
11-15 years	27	12,7	Turkish	28	13,2
16-20 years	44	20,8	Science	21	9,9
21-25 years	32	15,1	Maths	20	9,4
25 years and +	38	17,9	English	17	8,0
			Other	42	19,8

In determining the qualitative study group of the research, maximum diversity sampling, one of the purposeful sampling types, was used. Maximum variation sampling is a sampling method in which different situations that are similar to the research problem are identified and the study is conducted on these situations (Büyüköztürk, et al. 2020). This sampling type does not aim to generalise the diversity to the whole universe, but to determine the common features between the factors that show diversity (Yıldırım & Şimşek, 2018). In this direction, the study group of the research consists of 6 teachers in social studies, English, classroom, and science branches. Four of the teachers are female and two are male. Three of them have a seniority of 1-10 years and the other three have a seniority of 11-20 years.

Data Collection Tools

In the study, two different data collection tools were used to collect quantitative and qualitative data.

The Digital Competence Scale for Educators

The scale is a data collection tool consisting of two parts. In the first part, personal information about gender, seniority, education level and branch variables that are thought to affect teachers' digital competences were included. In the process of determining these variables, the relevant literature was reviewed and the personal information form was created by determining the variables thought to be effective on teachers' digital competences. The second part of the data collection tool is the Digital Competencies Scale for Educators (DigiCompEdu), which was developed by Redecker (2017) to measure the digital competence levels of educators and adapted into Turkish by Toker, Akgün, Cömert, and Edip (2021). The Digital Competencies Scale for Educators consists of 6 sub-dimensions and 22 items: Use of Digital Skills in Profession, Digital Resources, Teaching and Learning, Assessment, Empowering Students, and Facilitating Students' Digital Competencies. The Cronbach Alpha coefficient was .94 by the researchers who adapted the scale. As a result of the application of the scale, the participants are evaluated under six dimensions: beginner, explorer, integrator, expert, leader and pioneer. The score ranges of these dimensions are shown in Figure 2 according to competency levels.

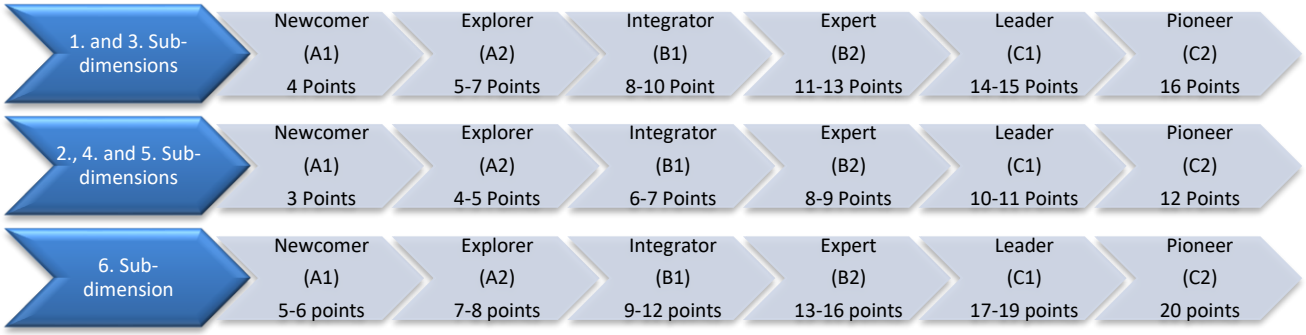

Figure 2. Score ranges in sub-dimensions of the scale (Toker, Akgün, Cömert ve Edip, 2021)

Interview protocol

The Digital Competence Interview Protocol is a semi-structured interview form develop by the researchers based on the Digital Competencies Scale (DCS). The interview form was developed to reveal the missing and hidden aspects of the quantitative findings. After the form was prepared by the researchers, it was presented to 2 field experts and 1 language expert. The interview form was given its final shape in terms of language and expression after expert opinions, and the measurement and evaluation dimension in the interview form was enriched in line with the common opinion of the field experts. Details of the interview process are given in Figure 3.

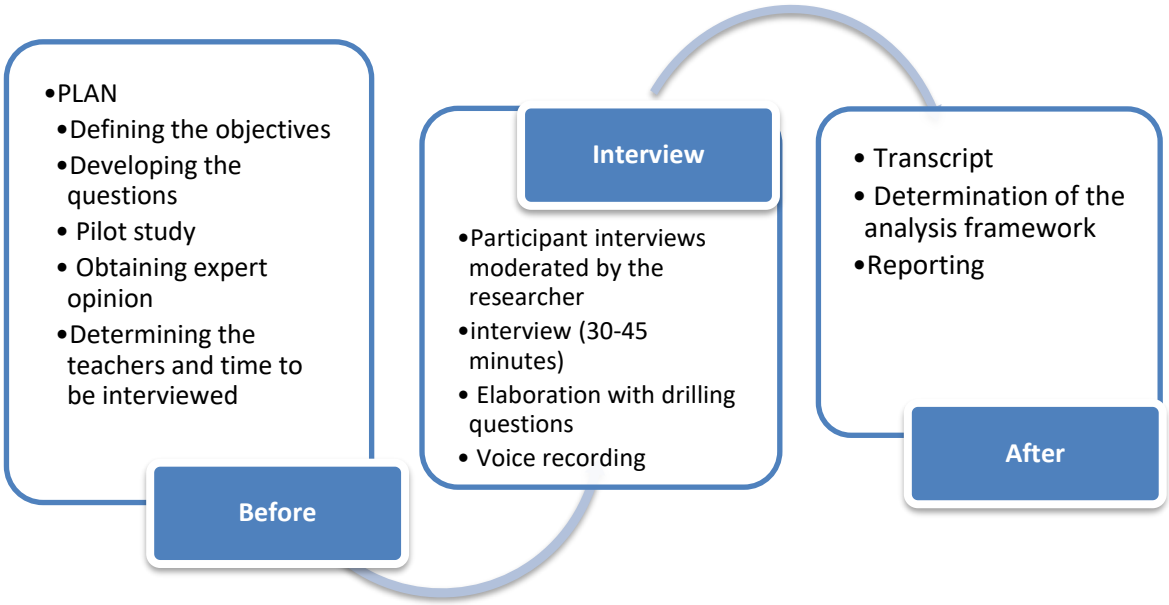

Figure 3. Qualitative Data Collection Process

Data Analysis

Quantitative Data Analysis

Normality test was performed to determine which statistical analysis technique to analyze the obtained data. The normality test is presented in Table 2.

Table 2. Normality test analysis

	Shapiro-Wilk			
	n	p	Skewness	Kurtosis
DCS	212	,128	,115	-,495

As seen in Table 2, the digital competence scale meets the normality test assumptions (skewness and kurtosis coefficients between +1 and -1) (Büyüköztürk et al., 2020, p. 40). Descriptive statistical methods such as frequency, percentage, arithmetic mean and standard deviation were used to determine the digital competence levels of teachers. Two-way analysis of variance was used for gender and branch variables, seniority, and education level variables. Statistical data analysis programme was used for all analyses. The significance level was accepted as .05.

Qualitative Data Analysis

After the quantitative data analysis, the interviews with the teachers were analysed in the second stage. The qualitative data of the study were analyzed using content analysis. Content analysis describes the analysis of many qualitative data by making sense of the data in order to determine the basic consistencies and underlying meanings (Patton, 2018). The purpose of content analysis is to identify themes, meanings, patterns and prejudices. In this way, the data obtained are analyzed and interpreted in a detailed, systematic and meticulous manner (Berg & Lune, 2015). In the content analysis process, MAXQDA 2020 package programme, known as qualitative data analysis programme, was used. The audio recordings obtained within the scope of the interviews were transcribed. Then, the data were coded by taking into account the European digital competence framework. In this context, coding was made under the categories of 1- Professional Engagement, 2- Digital Resources, 3-Teaching and Learning, 4-Assessment, 5-Empowering Learners, 6- Facilitating Learners' Digital Competence and 7-Problems.

FINDINGS

Quantitative Dimension

The findings related to the quantitative dimension of the research are presented below.

Table 3. The means related to the sub-dimensions of the digital competence scale according to the branches of the teachers

Branch	Professional Engagement x̄	Digital Resources x̄	Teaching and Learning x̄	Assessment x̄	Empowering Learning x̄	Facilitating Learning ' Digital Competence x̄
Turkish (n=30)	10,93	8,43	11,50	8,36	8,57	14,25
Social Studies (n=39)	**11,48**	9,30	11,25	8,23	8,60	14,60
Classroom Teacher (n=45)	10,89	8,59	11,18	8,41	8,41	13,18
Science (n=27)	9,67	7,86	11,05	7,90	8,05	12,67
Maths (n=22)	10,95	9,00	10,70	8,00	8,00	12,10
English (n=16)	**11,35**	10,12	11,29	8,41	9,24	14,18
Other (n=31)	10,83	8,81	11,64	9,07	8,60	13,33
Total (n=210)	10,91	8,83	11,28	8,41	8,50	13,55

As seen in Table 3, it is seen that the mean of Social Studies teachers is above the total mean in all sub-dimensions except Teaching-Learning and Evaluation sub-dimensions. The averages of English teachers are above the total average in all sub-dimensions except the sub-dimension of teaching-learning.

It is seen that the averages of mathematics teachers are above the total average in the sub-dimensions of the use of digital skills and digital resources. Turkish teachers' averages are above the total average in Teaching-Learning and Facilitation sub-dimensions; Classroom teachers' averages are above the total average only in Evaluation sub-dimension.

Table 4. Means and standard deviations for the total scores of the digital competence scale

Branch	x̄	Sd	Level
Turkish (n=30)	62,04	14,017	Expert
Social Studies (n=39)	**63,45**	15,215	Expert
Classroom Teacher (n=45)	60,66	13,416	Expert
Science (n=27)	57,19	9,642	Expert
Maths (n=22)	58,75	13,564	Expert
English (n=16)	**64,59**	10,186	Expert
Other (n=31)	62,29	15,293	Expert

As seen in Table 4, according to the predictor score ranges in the scale, it is seen that teachers in all branches are in the expert score range (50-65). The highest average in the expert score range belongs to English and Social Studies.

Table 5. Two-way analysis of variance results related to teachers' digital competences according to gender and branch variables

Source	Sum of Squares	df	Mean Square	F	P
Gender	1060,505	1	1060,505	5,857	**,016**
Branch	856,715	6	142,786	,789	,580
Gender * Branch	1313,641	6	218,940	1,209	,303
Fault	35853,809	198	181,080		
Total	840942,000	212			

As seen in Table 5, teachers' digital competences show a significant difference in terms of gender. When this difference is analysed, it is seen that the total scores of male teachers are higher. However, there is no significant difference between teachers on the basis of branch. Therefore, there is no significant difference in the two-way analysis of variance in which teachers' gender and branch variables are considered.

Table 6. Means and standard deviations of the total scores of the digital competence scale according to educational degree

Educational Degree	$\bar{x}$	Sd
Bachelor (n=167)	60,29	13,296
Master (n=45)	**65,86**	14,420

As seen in Table 6, it is seen that the total scores of teachers with postgraduate education are higher than those of teachers with undergraduate education.

Table 7. Two-way analysis of variance results related to teachers' digital competencies according to seniority and education level variables

Source	Sum of Squares	df	Mean Square	F	P
Seniority	533,080	4	133,270	,715	,582
Educ_level	349,182	1	349,182	1,875	,172
Seniority * Educ_level	407,050	4	101,762	,546	,702
Error	37627,900	202	186,277		
Total	533,080	4	133,270	,715	,582

As seen in Table 7, it is seen that there is no significant difference regarding the seniority variable of the teachers; again, there is no significant difference regarding the education level of the teachers. Therefore, it is seen that there is no significant difference as a result of two-way variance analysis related to seniority and educational status.

Table 8. Means related to the sub-dimensions of the digital competence scale

Dimensions	$\bar{x}$	Sd
Professional Engagement	2,72	,786
Digital Resources	**2,94**	,896
Teaching and Learning	2,81	,809
Assessment	2,80	,807
Empowering Learning	2,83	,845
Facilitating Learning ‘Digital Competence	**2,70**	,754

As seen in Table 8, it is seen that the Digital Resources sub-dimension has the highest mean in the digital competence scale. The lowest mean is seen in the Facilitation sub-dimension.

Table 9. Items with the highest and lowest means in the digital competence scale

Items with lowest mean scores	$\bar{x}$	Sd
I use digital technologies to work together with colleagues inside and outside my school.	*2,50*	*1,233*
When I propose digital tasks, I consider and approach possible problems.	*2,58*	*1,290*
I systematically use digital means to improve my communication with my students, their families, and my colleagues.	*2,60*	*1,008*
I propose tasks that require the students to use digital means to communicate and collaborate with each other or with an external audience.	*2,60*	*1,036*
I use digital technologies to allow my students to plan, document and evaluate their learning by themselves.	*2,63*	*1,174*
Items with highest mean scores		
I safely protect the sensitive content. For instance: exams, marks, personal data…	*3,28*	*1,253*
I use digital technologies so that my students participate actively in class.	*3,16*	*,919*
I participate in online training opportunities.	*3,15*	*1,109*
I monitor learners' behaviour and engagement in the collaborative digital environments I use	*3,02*	*1,282*
I carefully consider how, when and why to use digital technologies in class, to ensure that they are used with added value.	*2,85*	*1,003*

As seen in Table 9, it is seen that the items with the highest mean are about protecting personal privacy, using digital technologies and participating in online trainings. The items with the lowest mean were items about collaborating with colleagues in using digital technologies, using digital tools in communication with students and using digital tools in assessment and evaluation processes.

Qualitative Findings

Professional Engagement

Organizational Communications
All teachers stated that they use digital communication channels with students and parents. The most common communication tool used by teachers is "Whatsapp", a social media application. All of the teachers stated that each class has "parent groups" and that they communicate with parents in this way. The main purposes of parent groups are communication, homework, attendance notification and guidance. The other communication tool used by teachers is online meeting tools (zoom). Subject teachers stated that they have a large number of students (150-200 students) because they teach more than one class and it is not possible to reach the parents of each of them separately, but they can easily reach them through digital communication channels. Teachers stated that they started the widespread use of digital communication channels with the pandemic process and continued to do so. Not all teachers prefer to communicate via e-mail and other social media tools (Instagram-facebook).

Professional Collaboration
The teachers, especially the younger teachers, stated that they share materials with their colleagues. These teachers stated that they had groups related to their own subject areas and that they communicated and shared materials through these groups. English teachers stated that they shared materials and exams with their colleagues. Teachers also stated that they follow certain educational and professional groups through social media tools. Teachers stated that this method is economical and accessible. Teachers who stated that they work together with their colleagues in digital environments share a developed material rather than working on and developing a common educational material together.

Developing digital teaching skills
All teachers stated that they wanted to improve their digital teaching skills but they did not have enough opportunities for this. Some teachers stated that they needed professional support in digital teaching skills, but these opportunities were not provided to them regularly and continuously, and they tried to do something only with their own efforts. Some teachers stated that they could not develop their digital teaching skills and that they did not have any regular efforts in this direction.

Digital Resources

Using
All of the teachers stated that they tried to use digital resources. Teachers stated that the main purpose of using digital resources was to facilitate teaching. Some teachers stated that digital resources attracted the attention of students, so they preferred digital resources to increase the interest in the lesson, to make the lesson fun and for game purposes. Other teachers stated that they prefer digital resources especially for evaluation purposes and that digital resources facilitate their work.
The most commonly used digital resources are social media tools, education form sites, digital resources prepared by the Ministry of National Education such as Education Informatics Network (EBA), Teacher Informatics Network (ÖBA), Morpha campus, Okulistik. Teachers use sites and social media resources according to their branches. The devices that teachers use digitally are computers, mobile phones, projectors, smart boards and tablets.

Creating & Modifying
The majority teachers emphasized that they could not develop digital content and that they did not feel adequate in this regard. These teachers stated that they wanted to develop digital content very much, but they could not develop digital content due to both the intensity of the lessons and the lack of sufficient opportunities, and that producing digital content is a team work and they cannot do it alone. Teachers stated that they needed professional training on this subject. However, English and social studies teachers stated that they tried to develop digital content. These teachers stated that they could produce limited digital content especially through Google forms, Microsoft Office, wordwall and some evaluation sites. These teachers stated that they mostly tried to produce content for presentation, visualisation and evaluation purposes. These teachers also stated that they could use existing digital resources by making necessary changes.

Teaching and Learning

Teaching
All of the interviewed teachers were able to express that they tried to use digital technologies in the classroom. The teachers stated that they were able to use the computer, projection or smart board in the classroom within the possibilities of the school. The English teacher stated that there is a great need for technology in the language teaching process in the classroom and that she uses it widely.

The classroom teacher stated that she used it while watching videos related to the subjects. The social studies teacher stated that social studies course cannot be taught without technology support.

Collaborative Learning
All of the teachers stated that the students were very interested in technology and that they could use it together in the classroom. It was stated that students are more active when technological tools are used during the lesson. Especially in making technological tools ready for the lesson, they are used with students to play games during the lesson.
However, teachers do not use digital environments with their students for teaching purposes after the pandemic, they do not need to do so. Therefore, they emphasized that students do not work in groups in digital environments, and they do not know how to do this.

Assessment

Teachers emphasized that it is quite difficult to follow the progress of students due to the large number of students. Although teachers try to follow students' progress, they do not use digital assessment tools to monitor student progress and provide feedback.

Empowering Learners

Most of the teachers stated that daily homework is communicated through digital tools, but they do not create digital homework. These teachers especially stated that daily homework is sent to parents via WhatsApp and homework is given in this way. Social studies teachers who used technology more widely stated that they gave homework through special software. These teachers stated that they used software such as Google form, zipgrade, Wordwall, etc. Teachers who did not use digital tools for homework at all stated that they did not prefer to give homework because not all students had equal access to digital tools or those who had access could not be controlled. Teachers are especially concerned that students spend too much time with digital tools and that this situation affects children negatively.

Students' Digital Content Production
Teachers stated that students did not produce digital content. Teachers stated that they could not encourage students to produce digital content due to their lack of competence in this field and that students could only prepare presentations. Teachers stated that students are better than themselves in the use of digital technology, but students should be directed to this field.

Facilitating Learners' Digital Competence

Digital Security
All the teachers who used digital technologies emphasized that they tried to pay attention to digital security and tried to teach these security methods to their students. They suggested students to create different and strong passwords, not to click on different links and to use antivirus programmes.
Some teachers stated that they directed students to use official websites (eba, tubitak etc.). Apart from this, different security methods are not known by the teachers.

Responsible Use
Teachers agree that it is very difficult to guide students to use safely and responsibly. Teachers think that students use many different applications and content, so it is very difficult to control them. Teachers suggest that students should check the sources of the information they receive, they should show the source, and they should not turn on their cameras for security purposes. It was emphasized by some teachers that students are mostly in digital environments outside the school, so families have a greater duty and that families should be made aware of this issue. In addition, not all teachers know how to encourage students to use digital technologies creatively to solve a concrete problem.

Problems
Teachers experience problems in the use of digital technologies due to themselves, students and lack of infrastructure. One of the most common problems faced by teachers is the problem of access to digital tools. The fact that not all students have access to digital tools and the internet is expressed as a basic problem. In addition, the lack of necessary technology and software in schools and the inability to find solutions in a short time when a problem is encountered is another problem. Some teachers emphasized that they had problems in accessing the special content of their courses and that using social media tools such as Youtube during the lesson caused some problems. Teachers' inability to control students' safe and responsible use of digital media was expressed as another problem. Teachers also state that the fact that they themselves are not competent in the use of digital technology is also a problem.

RESULTS AND DISCUSSION

Both quantitative and qualitative results of the study show that all teachers prefer to use digital tools at a limited level. The quantitative results of the study reveal that teachers use digital tools at the "expert" level according to the scale classification. However, the qualitative results of the study show that teachers mostly use digital tools at the "integrative" level. Integration of technology into the teaching process requires deep technological knowledge as well as the knowledge of which technology is used, where how and for what purpose. The ability to use technology plays a key role in teachers' ability to bring existing technologies into the classroom (Bozkurt & Cilavdaroğlu, 2011). From this point of view, it can be stated that although teachers have technological knowledge, they cannot reflect their technological knowledge to learning-teaching processes and they have deficiencies in terms of where and for what purpose to use digital tools in lessons.

Teachers cooperate with their colleagues to a limited extent in using digital technologies. The qualitative results of the study show that teachers do not work together with their colleagues on a common educational material, but rather share a developed material. Spiteri and Rundgren (2017), in their study aiming to investigate the digital competence of Maltese primary school teachers, concluded that teachers are willing to communicate and collaborate, but they are not willing to share resources online and communicate activities to parents online.

Both quantitative and qualitative findings of the study reveal that teachers can use digital tools with students in the classroom at a limited level and that both they and students cannot develop digital content. The technological tools that teachers commonly use in the classroom are computer, projection and smart board. Similarly, Keleş, Öksüz, and Bahçekapılı (2013) point out that most of the teachers use the interactive board during the lesson for viewing-based applications such as slides, films, animations where the student remains in a passive state; when the applications made with interactive board, projection and tablets are examined, all applications are only non-interactive applications. Spiteri and Rundgren (2017) show that teachers spend more time searching for digital resources rather than developing digital content. Teachers use videos, PowerPoint presentations, games and downloaded programmes as ready-made content in lessons. Only a few teachers provide better creation of information and content (Spiteri & Rundgren, 2017).

The quantitative results of the study reveal that teachers are willing to use digital resources; the qualitative results reveal that teachers feel themselves inadequate in developing digital content, need professional help, and therefore cannot help students develop digital content.

Teachers use technology in the classroom in a limited way with students. It is mostly used to make technological tools ready for the lesson and to play games with students during the lesson. Similarly, in another study, in terms of the time spent by teachers to use technology in lessons, it was concluded that most of the teachers use technology at a certain stage of the lesson, not in the whole lesson; very few teachers use technological tools in the whole lesson (Spiteri & Rundgren, 2017). In a similar study, both male and female teachers limit their students' use of technology in order to support and maintain their current teacher-centered practices (Lucas, Bem-Haja, Siddiq, Moreira, & Redecker, 2021). Uslu (2017) concluded in his study that teachers started to use digital technology in their lessons, but their use of technology could not go beyond teacher-centered activities. In addition, in his study, he states that teachers use digital tools only in teacher-centered technology activities; they are not used in activities that will develop students' high-level skills. In another study, it was tried to determine for what purpose mathematics and classroom teachers who stated that they use technology in their lessons use technology and what they consider while using it. It is stated that teachers mostly use M. Office Applications, and the number of teachers using dynamic mathematics and geometry applications is low (Bozkurt & Cilavdaroğlu, 2011). In a study conducted on preschool teachers' use of Internet resources in the process of their professional development, it was concluded that teachers, regardless of their gender, work experience or education level, use digital tools less than other traditional teaching tools (Prtljaga & Savić, 2017). This shows that teachers have deficiencies in integrating digital tools with student-centered activities.

Teachers cannot use digital tools widely in assessment and evaluation processes. Qualitative results show that teachers use digital tools only for assignment submission purposes and that they do not have a good command of digital tools/software for assessment except for a few teachers. In a study conducted by Lucas, Bem-Haja, Siddiq, Moreira, & Redecker (2021) with teachers in Portugal, it was found that teachers were inadequate in assessment-evaluation formats using digital technologies. Digital assessment and evaluation methods offer students many types of learning that enable the development of higher-level thinking skills. Assessments made with animations, games and interactive activities in the digital world improve students' learning abilities (Eyal, 2012). It is seen that the use of digital tools in the evaluation phase as well as in the learning-teaching process has many benefits in terms of the effectiveness of teaching. In this respect, it is important for teachers to complete their lack of knowledge about digital assessment and evaluation processes.

The quantitative results of the study reveal that the digital competences of social studies teachers and English teachers are higher than the averages of other branches. In qualitative interviews, it is seen that especially social studies and English teachers are more willing to use digital tools. These teachers think that these courses cannot be taught without digital tools. Arslan (2019) found that

the digital literacy level of English, French and German teachers was high in his study. The reason for this is explained in the study as teaching foreign languages more easily and effectively with digital tools. It was determined that the digital literacy level of the social studies branch was low compared to other branches. Keskin and Yazar (2015) concluded that in the context of lifelong learning and in the light of twenty-first century skills, one of the branches with the highest digital competences is English; Social Studies branch is among the branches with low digital competence.

It is seen that teachers' digital competencies show a significant difference in favour of male teachers in terms of gender. The qualitative findings of the study also support this result. Cabezas-Gonzalez, Casillas-Martín, Sanches-Ferreira & Teixeira Diogo (2017), in their study to determine the levels of digital competence, concluded that men consider themselves superior to women in terms of knowledge, management and attitude about digital competence and that their digital literacy levels are higher. In Yontar's (2019 concluded that the average digital literacy level of male participants was significantly higher than female participants. It was determined that male teachers were more willing to use digital resources, teaching, learning, evaluation and safe use. Lucas, Bem-Haja, Siddiq, Moreira, & Redecker (2021) stated that gender is an important predictor of digital competence in relation to the relationship between digital competence and personal factors and that it is in favour of male teachers. In addition, the study reveals that male teachers show higher competence in finding, creating and sharing digital resources and teaching and learning. Gökbulut, Keserci, and Akyüz (2021), in their study on digital material design competences, found that the digital material design competence levels of male academics were higher than female academics.

Both quantitative and qualitative results of the study reveal that teachers attach importance to digital security. For security purposes, teachers recommend students to create different and strong passwords, not to click on different links and to use antivirus programmes. However, teachers think that it is very difficult to guide students to use digital tools safely and responsibly. Teachers believe that students use a large number of different applications and contents, so it is very difficult to control them. Yılmaz, Şahin, and Akbulut (2016) found that teachers had high awareness of digital data security in their study. Canoğulları (2021), on the other hand, investigated the awareness of teachers on information security and found that they had insufficient knowledge on issues such as cyber fraud, information theft, malware and personal information security. Gökmen and Akgün (2015) concluded in their study that teachers' pre-service proficiency levels towards information security were low.

Suggestions

- It is seen that teachers use digital resources to access ready-made information and there are deficiencies in the dimension of producing information. Teachers can be trained to produce digital educational content.
- It has been determined that teachers are deficient in digital cooperation with other teachers. Platforms for the use of common digital working and sharing areas can be developed and teachers can be trained.
- Platforms such as EBA and Morpha Campus can be revised to allow teachers to collaborate with each other.
- In order to expand the use of digital content in measurement and evaluation processes, existing digital platforms can be revised, new software for measurement and evaluation can be developed and created.

Ethics and Consent: Ethics committee approval for this study was received from the Ethics Committee of Kırşehir Ahi Evran University (Date: 03.03.2022; Approval Number: E-51450103-050.01.04-00000404729

Conflicts of Interest and Authorship: No conflicts of interest and authorship to declare. **Funding:** No funding has been received for this study.

REFERENCES

Alarcón, R., Del Pilar Jiménez, E., & de Vicente-Yagüe, M. I. (2020). Development and validation of the DIGIGLO, a tool for assessing the digital competence of educators. *British Journal of Educational Technology*, *51*(6), 2407-2421. https://doi.org/10.1111/bjet.12919

Antonietti, C., Cattaneo, A., & Amenduni, F. (2022). Can teachers' digital competence influence technology acceptance in vocational education?. *Computers in Human Behavior, 132*, 107-266. https://doi.org/10.1016/j.chb.2022.107266

Arslan, S. (2019). *İlkokullarda ve Ortaokullarda Görev Yapan Öğretmenlerin Dijital Okuryazarlık Düzeylerinin Çeşitli Değişkenler Açısından İncelenmesi* (Yüksek Lisans Tezi). Sakarya Üniversitesi Eğitim Bilimleri Enstitüsü, Sakarya.

Avci, U., Kula, A., & Haslaman, T. (2019). Teachers' opinions on technology that they want to integrate into the learning-teaching process. *Acta Infologica, 3*(1), 13-21. https://doi.org/10.26650/acin.556003

Berg, B. L., ve Lune, H. (2015). *Sosyal bilimlerde nitel araştırma yöntemleri* (çev. Ed. Hasan Aydın). Konya: Eğitim Yayınevi.

Bozkurt, A., & Cilavdaroğlu, A. K. (2011). Matematik ve sınıf öğretmenlerinin teknolojiyi kullanma ve derslerine entegre etme algıları. *Kastamonu Eğitim Dergisi, 19*(3), 859–870.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2020). *Bilimsel araştırma yöntemleri* [Scientific research methods]. Ankara: PegemA yayıncılık.

Cabero-Almenara, J., Gutiérrez-Castillo, J. J., Palacios-Rodríguez, A., & Barroso-Osuna, J. (2020). Development of the teacher digital competence validation of DigCompEdu check-in questionnaire in the university context of Andalusia (Spain). *Sustainability, 12*(15), 6094. https://doi.org/10.3390/su12156094

Cabezas-Gonzalez, M., Casillas-Martín, S., Sanches-Ferreira, M., & Teixeira Diogo, F. L. (2017). Do gender and age affect the level of digital competence? A study with university students. *Fonseca Journal of Communication, 15*, 109-125. https://doi.org/10.14201/fjc201715109125

Caena, F., & Redecker, C. (2019). Aligning teacher competence frameworks to 21st century challenges: The case for the European Digital Competence Framework for Educators (Digcompedu). *European Journal of Education*, *54*(3), 356-369. https://doi.org/10.1111/ejed.12345

Canoğulları, E. (2021). Öğretmenlerin bilgi güvenliği konusundaki farkındalıklarının incelenmesi. *Kalem Uluslararası Eğitim ve İnsan Bilimleri Dergisi, 11*(2), 651-679. https://doi.org/10.23863/kalem.2021.219

Creswell, J. W. (2017). *Eğitim araştırmaları: Nicel ve nitel araştırmanın planlanması, yürütülmesi ve değerlendirilmesi*. İstanbul: Edam Yayıncılık.

Creswell, J. W. & Plano Clark, V. L. (2020). *Karma yöntem araştırmaları tasarımı ve yürütülmesi* (Y. Dede, S. B. Demir, Çev.), Ankara: Anı Yayıncılık.

Eyal, L. (2012). Digital assessment literacy—The core role of the teacher in a digital environment. *Journal of Educational Technology & Society*, *15*(2), 37-49.

Gökbulut, B., Keserci, G. ve Akyüz, A. (2021). Eğitim fakültesinde görev yapan akademisyen ve öğretmenlerin dijital materyal tasarım yeterlikleri. *Journal of Social Sciences and Education*, *4*(1), 11-24. https://doi.org/10.53047/josse.917536

Gökmen, Ö. F., & Akgün, Ö. E. (2015). Bilgisayar ve öğretim teknolojileri eğitimi öğretmen adaylarının bilişim güvenliği eğitimi verebilmeye yönelik yeterlilik algılarının incelenmesi. *İlköğretim Online, 14*(4), 1208-1221. https://doi.org/10.17051/io.2015.04635

International Society for Technology Education (ISTE) (2021). ISTE Standards. https://cdn.iste.org/www-root/PDF/ISTE%20Standards-One-Sheet_Combined_09-2021_vF3.pdf adresinden 09.10.2023 tarihinde erişilmiştir.

Keleş, E., Öksüz, B. D., & Bahçekapılı, T. (2013). Teknolojinin eğitimde kullanılmasına ilişkin öğretmen görüşleri: Fatih projesi örneği. *Gaziantep University Journal of Social Sciences*, *12*(2), 353-366.

Keskin, İ., & Yazar, T. (2015). Öğretmenlerin yirmi birinci yüzyıl becerileri ışığında ve yaşam boyu öğrenme bağlamında dijital yeterliliklerinin incelenmesi. *International Journal of Human Sciences*, *12*(2), 1691-1711. http://dx.doi.org/10.14687/ijhs.v12i2.3503

Levano-Francia, L., Sanchez Diaz, S., Guillén-Aparicio, P., Tello-Cabello, S., Herrera-Paico, N., & Collantes-Inga, Z. (2019). Digital Competences and Education. *Journal of Educational Psychology-Propositos y Representaciones*, *7*(2), 579-588. http://dx.doi.org/10.20511/pyr2019.v7n2.329

Lucas, M., Bem-Haja, P., Siddiq, F., Moreira, A., & Redecker, C. (2021). The relation between in-service teachers' digital competence and personal and contextual factors: What matters most? *Computers & Education, 160*, 104052. doi: 10.1016/j.compedu.2020.104052.

Lucas, M., Dorotea, N., & Piedade, J. (2021). Developing teachers' digital competence: Results from a pilot in Portugal. *IEEE Revista Iberoamericana de Tecnologias del Aprendizaje, 16*(1), 84-92. https://doi.org/10.1109/RITA.2021.3052654

MEB (2018). Sosyal Bilgiler Dersi Öğretim Programı. http://mufredat.meb.gov.tr/Dosyalar/201812103847686-SOSYAL%20B%C4%B0LG%C4%B0LER%20%C3%96%C4%9ERET%C4%B0M%20PROGRAMI%20.pdf adresinden 10.03.2023 tarihinde erişilmiştir.

Napal Fraile, M., Peñalva-Vélez, A., & Mendióroz Lacambra, A. M. (2018). Development of digital competence in secondary education teachers' training. *Education Sciences*, *8*(3), 104. https://doi.org/10.3390/educsci8030104

Niemi, H., Kynäslahti, H., & Vahtivuori-Hänninen, S. (2013). Towards ICT in everyday life in Finnish schools: Seeking conditions for good practices. *Learning, Media and Technology*, *38*(1), 57-71. https://doi.org/10.1080/17439884.2011.651473

OECD (2023). Teaching for the Future: Global Engagement, Sustainability and Digital Skills. https://read.oecd-ilibrary.org/education/teaching-for-the-future_d6b3d234-en#page1 adresinden 15.05.2023 tarihinde erişilmiştir.

Patton, M. Q. (2018). *Nitel araştırma ve değerlendirme yöntemleri* (çev. Ed. Mesut Bütün ve Selçuk Beşir Demir). Ankara: Pegem Akademi Yayıncılık

Prtljaga, P., and Z. Savić. 2017. "The Use of the Internet Sources in the Professional Development of Preschool Teachers." *Croatian Journal of Education, 19* (2), 479–510. doi:10.15516/cje.v19i2.2336.

Redecker, C., 2017. European framework for the Digital Competence of Educators: DigCompEdu (No. JRC107466). Joint Research Centre (Seville site).

Spiteri, M., and S. N. Rundgren. 2017. "Maltese primary teachers' Digital competence: ımplications for continuing professional development." *European Journal of Teacher Education 40* (4): 521–534. doi:10.1080/02619768.2017.1342242.

Toker, T., Akgün, E., Cömert, Z., & Edip, S. (2021). Eğitimciler için dijital yeterlilik ölçeği: uyarlama, geçerlik ve güvenirlik çalışması. *Milli Eğitim Dergisi*, *50* (230), 301-328. https://doi.org/10.37669/milliegitim.801607

UNESCO (2018). Öğretmenlere Yönelik Bilgi ve İletişim Teknolojileri Yetkinlik Çerçevesi. http://yegitek.meb.gov.tr/meb_iys_dosyalar/2021_01/18130452_UNESCO_OYretmenlere_Yonelik_Bilgi_ve_YletiYim_Teknolojileri_Yetkinlik_Cercevesi.pdf adresinden 15.05.2023 tarihinde erişilmiştir.

Uslu, Ö. (2017). Evaluating the professional development program aimed technology integration at the era of curriculum change. *Educational Sciences: Theory & Practice*, *17*(6), 2031-2055. https://doi.org/10.12738/estp.2017.6.0116

We Are Social. (2021). Digital 2021: Global Overview Report. https://www.slideshare.net/DataReportal/digital-2021-local-country-headlines-reportjanuary-2021-v03 adresinden 17.03.2023 tarihinde erişilmiştir.

Yılmaz, E. O., & Toker, T. Covıd-19 salgını öğretmenlerin dijital yeterliliklerini nasıl etkiledi?. *Milli Eğitim Dergisi, 51*(235), 2713-2730. https://doi.org/10.37669/milliegitim.896996

Yılmaz, E., Aktürk, A., & Çapuk, S. (2021). Dijital öğretmen yeterlilik ölçeği geliştirme: geçerlik ve güvenirlik çalışması. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, (38*), 34-68. https://doi.org/10.14520/adyusbd.950728

Yılmaz, E., Şahin, Y. L., & Akbulut, Y. (2016). Öğretmenlerin dijital veri güvenliği farkındalığı. *Sakarya University Journal of Education, 6*(2), 26-45. https://doi.org/10.19126/suje.29650

Yontar, A. (2019). Öğretmen adaylarının dijital okuryazarlık düzeyleri. *Ana Dili Eğitimi Dergisi, 7*(4), 815-824. doi: 10.16916/aded.593