The Current State of Digital Learning in the 21st Century

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Introduction

In the report of the Organization for Economic Cooperation and Development (OECD) conducted in 2014 it is stated that Turkey has the highest value in the use of technological tools and equipment after Britain. It is also noted that over 59% of the world average rate of change and renewal in the field of education is in Turkey. According to 2019 data 99% of homes in Turkey, have smartphones. However, it is known that almost 87% of households have access to the internet. Also, it has been determined that 82% of men and 70% of women have access to and can use the internet (Arseven, 2020). Apart from all this, it has been determined that 4.54 billion people can use the internet in 2020 worldwide. 3.80 billion people in the world have social media accounts. It has been determined that more than 5.19 billion people in the world have mobile phones and each internet owner uses the internet for an average of 6 hours and 43 minutes a day (Geçgel, Kana, & Eren, 2020). When we look at Turkey, the technological developments in the world and search the internet for this information, the use of digital technology in the teaching-learning process is understood to be inevitable.

Various activities are carried out due to factors such as easier learning, accessing, and using information faster in the education process. These activities cause the most practical and solution-providing methods to be used to access or structure information (Ling Koh, & Pei Kan, 2020). In choosing these methods; Factors such as students, goals, activities, assessment, and learning environment culture appear as determining factors. Here, the term learning environment can be thought of as the classroom (setting) in which education takes place, although it usually has a traditional connotation as a room consisting of rows and blackboards lined up one after another. As it is known, the education and training process takes place in the classroom environment. In some definitions, even concepts such as "between four walls" are used (Kara, 2020). The insufficiency of this concept has emerged over time. Because it is perceived as being attached to a place or environment by staying between four walls. In the education process, learning can take place in space. However, it was thought that it lacked competence, persistence, speed, or reaching many examples (Taş et al., 2015). It is understood that different physical spaces, environments, and cultures where students perform the learning activities are also required. It has been observed that students can learn outside of school, outdoors, or in similar very different, and diverse environments. So much that in order to facilitate learners' access to information, the effectiveness of learning has been increased by

carrying various tools and equipment within the four walls. By creating laboratories in schools, learning has been made more concrete and appealing to the senses. Also, some subjects or educational practices that were not satisfied with these were carried out, out of school. Changing the learning environment, seeing on the spot, national park trips, zoos, or out-of-school education was made (Okur-Berberoğlu & Uygun, 2013). Apart from all these, with the development of technology and time, the use of technological tools has gained importance in education and training environments. Digital technologies have become important in education, especially with the discovery of the internet and the widespread use of computers.

In the 2010s digitization years in education in Turkey “Industry 4.0", which was put forward with the agenda (Özbek, 2020). The importance of industry 4.0 was emphasized in the 2023 vision document of the Ministry of National Education (MoNE). It is thought that the aim here is that children are expected to be qualified, moral people who are interested in science and culture along with the skills of the age and the future (MoNE, 2020). Also, MoNE emphasized that individuals should be raised with the concept of “digital skills” with their knowledge, skills, and behaviors (Yazıcıoğlu, Yaylak & Genç, 2020).

Digital Transformation

The development and change of web-technology integration into educational processes has been observed from past to present. Especially the use of new web technologies has led to a new perspective (Selwyn, 2007). The development of these technologies provides education independent of time and space and with enriched course contents (Işık, Işık, & Güler, 2010). These developments aim to overcome the restrictions of informal education and increase teacher-student interactions. It is thought that students are familiar with digital technologies today, where technology and digitalization are developing intensively. It was determined that students know how to access, create, and share information using technology (Yazıcıoğlu, Yaylak, & Genç, 2020). With the technological skills of students coming to the forefront, researchers and practitioners have turned to design learning processes appropriate to students' needs, expectations, and learning styles (Blau, Grinberg, & Shamir-Inbal, 2018). Also, students who have placed technology at the center of their lives are in the 21st century. To train them with their skills and to make their learning more effective, they started to turn to different quests where technology is integrated into education (Korucu, 2020). The search for digitalization or the use of digital technologies in many branches of society has also manifested itself in the education sector.

The transformations of societies took place in three waves. Agriculture, industry, and knowledge factors have provided permanent changes in societies (Alp & Levent, 2020).

Apart from these waves, digitization is thought to have a similar effect. In the digital age, it is thought that many societies or individuals are trying to digitize, at least they are willing to use, develop, and renew digital technologies. Also, they aim for a stronger education by differentiating traditional roles with the integration of digital technologies in the education and training processes of individuals.

As the functions of the education and training process were renewed, the roles of teachers have also changed. The teacher, who was seen as the only source of information in the classroom, has gradually become a guide. Rather than a tool that teaches the knowledge, it has a different meaning that directs and mediates access to information. Because today students' opportunities to access information have diversified. It is known that the student can capture information from many branches. In these stages, the teacher guides the student in developing their cooperation, collecting, organizing, evaluating, and using information. Especially the development of digital technologies and the necessity of having skills in this field made it necessary for students to get help. Digital transformation; is the transformation of existing digital tools, processes, and competencies into digital skills in harmony with changes and opportunities (Parsehyan, 2020). The development of this ability of the individual enables him/her to adapt to situations such as realizing the needs of the age in the digital transformation process, mastering digital tools, being aware of the risks in digital environments, observing personal rights in the virtual environment, and being open to changing and developing technological innovations (Manap & Durmuş, 2020).

In digital transformation, first of all, individuals who teach and implement education need to know and realize the digital and educational technologies (Raike, Keune, Lindholm, & Muttilainen, 2013). It is essential to enrich learning activities in the classroom and to create learning environments that arouse interest in students with learning styles, strategies, skills, and approaches. Also, it should support the development of students' success with activities that increase learning and remembering in students. For learning and teaching activities in schools or virtual classrooms to be equipped with the skills of the age and the future, firstly, teachers should be informed about digital technologies and their use. Subsequently, with similar training to be applied to students, it is ensured that all elements of education life can use digital technology and content. Sound, text, animation, 3D interactions are used in these digital contents (Sezgin & Karabacak, 2020).

The first examples of digital transformation in the world date back to the 1960s. Especially studies on computers and their use date back to these periods. It took the 1980s for some universities in the USA and Japan to start preparing networks and using the internet. Not only the USA and Japan but many countries, especially Germany and Russia, have acted with this trend. Institutional and individual studies have been done many times in Turkey, although the formal sense in the digital transformation of the 2019 Higher Education

Institutions in Council of Higher Education (CoHE) has been announced as one of the main goals. First of all, strategies related to digital transformation were determined for target groups through pilot universities. It started with 8 universities in November 2018, and the Digital Transformation Project in Higher Education was implemented with 8 other pilot universities in July 2019. First, the lecturers of 16 pilot universities are taught Digital Literacy, which is applied to undergraduate and then associates' degree programs in the following academic years (Sezgin & Karabacak, 2020). In this course, topics such as internet and portable technologies, social networks, future technologies and information ethics are given (Ataş & Gündüz, 2020).

Digital Literacy

Internet and digital applications that emerged with the big explosion in the world of information provided new developments. Social platforms, which have gained a spatial dimension with their written, visual and auditory features, have created a new literacy phenomenon (Özcan, 2017). Digital literacy is an old concept. It emerged in the 1980s when computer literacy was poorly defined in terms of goals and requirements (Sezgin & Karabacak, 2020). Digital literacy was first defined as Gilster's (1997) ability to understand and use the information provided via computers and received from various sources in digital environments (Pala & Başıbüyük, 2020; Yazıcıoğlu, Yaylak, & Genç, 2020). The purpose of this definition is to emphasize the importance of computer skills and learning with computers.

Digital literacy is the capability of perceiving, evaluating, analyzing, and sending appropriate messages to written and visual messages provided by communication tools (Potter, 2013). Digital literacy is to be able to overcome the virtual environments with information pollution in the developing and widespread technological age and to realize the reliability of "edu" and "gov" extensions (Ataş & Gündüz, 2020; Eroğlu, 2020). It is known that digital literacy is also cultivated in problem-solving, research, skill acquisition, and creating collaborative social interaction areas (Jesson, McNaughton, and Wilson, 2015; Kardeş, 2020). Apart from these data, it is claimed that some employers and educators do not adequately prepare their students for digital literacy in higher education institutions (Webb, 2019; Yazıcıoğlu, Yaylak, & Genç, 2020). It is known that some universities assume that students are at a sufficient level while they need to increase their competence in this subject (Murray & Pérez, 2014). However, it is essential to have and gain literacy in the digital age. Because digital literacy is perceived as the most basic skill that enables individuals to work together with software tools and perform information retrieval tasks.

In terms of digital literacy, it is known that the digital literacy status of male teacher candidates is generally better than female teacher candidates (Yazıcıoğlu, Yaylak & Genç,

2020). When examinations were made based on branches, no significant relationship was found between preschool and classroom teachers. However, it was determined that preschool teachers stated that digital literacy is beneficial and contributes to the development of the child (Kardeş, 2020). A study found that fifth-grade students generally have high scores on digital literacy skills. Also, it is known that children who have a higher frequency of connecting to the internet have better digital literacy than those who have the internet at home. However, digital literacy is not thought to affect gender (Pala & Başıbüyük, 2020). Apart from all these data, “digital literacy” is frequently expressed for virtual information and communication tools in educational environments. The concept of digital is understood with the awareness of "computer-based / supported", "online," “network", "web” or “e” expressions. Today (digital age), many public institutions and organizations are trying to get the title of "digital" (Sezgin & Karabacak, 2020).

Digital Learning

Digital learning is a teaching application that provides effective use of technology with a wide range of tools and applications to strengthen the individual's learning experience (Hover & Wise, 2020). Digital learning, which includes applications developed in the web environment, receives minimal support from computer applications or programs. It generally includes media consisting of texts, sounds, videos, and photographs. It also includes identifiable and definable goals and assessments for teachers and students (Becker, 2010).

In the digital learning environment, there are three elements: (1) communication, (2) resource, and (3) evaluation (Thoma, et al. 2019). These elements require the ability to connect and stay in communication between teachers and students interacting with digital learning environments, or within students. Teachers and students should use reliable sites or blogs as a source of information and make objective evaluations with these tools. Also, Guo, Bussey, and Adachi (2020), suggest four steps to ensure efficiency in digital learning, to be effective in education, and to adapt to students' cultures. (1) cooperation; mutual interaction and communication and sharing of teachers and learners, (2) adoption; especially supporting students in digital messaging, getting help and usage, (3) activation; motivating students in learning and achieving, supported by teachers, (4) competence; In particular, teachers must have knowledge of digital technologies and competence in using them. Thanks to this competence, teachers, and students will not have difficulty in designing digital learning materials in the process. In the digital learning process with digital technologies; They can express detailed learning objectives, design principles derived from theories about learning and teaching, and develop design patterns (Busstra et al., 2008).

Through the use of digital technology in Turkey digital learning environments costing us

the society are available. The largest of these is the Increasing Opportunities, Technology Improvement Movement (FATİH) project carried out by the Ministry of National Education and the Digital transformation and distance education platforms carried out by the Higher Education Institution. The digital transformation project is quite new, as described above. This project, which includes new and digital elements, will lead to the delivery of some of the lessons through this channel in the future. However, distance education, which has been practiced in the country for years, has been adopted by open education universities. Especially in this method used by the Ministry of National Education together with the pandemic process, the integration of both distance education and the FATİH project draws attention. With this integration, students were able to communicate with each other or with their teachers, and a connection with reliable and used resources was provided. However, many teachers within the ministry could not make student evaluations. Especially in the eastern regions, rural and mountainous areas, the evaluation could not be made as an equal opportunity could not be achieved due to the lack of network, internet, and technology (detailed in the conclusion section)..

FATİH Project

Turkey is since 1998 responsible for the integration of education and technology Innovation and Educational Technologies General Directorate at the Ministry of Education site (YEĞİTEK in 2011, has been updated name). MoNE in 1984-2013; By signing protocols and contracts with international institutions and organizations such as Microsoft, the World Bank, Intel, and the European Investment Bank, it found financiers for projects that increase the information technologies infrastructure (Topuz & Göktaş, 2015). Especially in the 2000s, computer classes/laboratories have been established in schools with many donors and funds.

When computers and the internet started to spread, MoNE tried to strengthen the infrastructure of schools. Although information technology classes have been established within the schools, students' curiosity and interest in technology have increased in parallel. While informatics classes increased between 2003 and 2009, after these dates, the focus of attention of students, parents, and even teachers changed with the introduction of phones with interactive (touch) computers. Due to this rapid technological change, the opportunities for students' interest shifted from computers in informatics classes to interactive mobile phones. This indifference in schools has manifested itself. As a matter of fact, after a few years, informatics classes in schools completely lost interest and their doors were locked. The Ministry of National Education has developed the FATİH project both to integrate technological developments into education and to change the direction of students' interests.

Within the scope of the Fatih project, which started in 2010, it is aimed for every teacher

and student to use digital content. Under the FATİH Project, primarily the infrastructure of the schools was strengthened. It has at least established a new and usable internet and technology infrastructure for non-existent structures. Later, he installed interactive boards in each of the 450 thousand classrooms of approximately 14 thousand schools. Interactive boards contain all the features of the age and are easy to learn and use. Also, it distributed tablets integrated into interactive boards to 700 thousand teachers and students, primarily secondary education (Geçgel, Kana, & Eren, 2020). Afterward, the desired efficiency could not be obtained from the use of tablets and they were not distributed outside secondary education. Although redistribution for distance education has come to the fore during the pandemic process, there is currently no development. MoNE has provided in-service training to approximately 1 million teachers and administrators, as well as establishing the infrastructure for teachers, students, and schools. The purpose of this training, to have competent personnel who can use digital content and technology integration. Also, the Education Informatics Network (EBA) has been established so that teachers and students can both add their digital content and use existing digital content. EBA has been continuously updated. As a matter of fact, "EBA" has been its greatest savior during the pandemic period. Thanks to EBA, the relationships between printed educational materials and digital materials have been connected, and it has become a powerful supplementary resource for teachers and students (Özbek, 2020). With the integration of some digital programs with EBA, it has reunited the students who were at their homes during the pandemic and their teachers through a distance education..

Distance Education

It is known that one of the best aspects of traditional educational approaches is the ease with which one person can convey information to more than one person and save time. Distance education can be thought of as making this feature face-to-face with web support. It is seen as a kind of blended education (Budak, Çoban Budak, 2012). It is made by integrating the best features of technology with the best aspects of traditional teaching methods. Many people can be reached at the same time thanks to the Internet and computers. Also, one person can provide training on many subjects in a short time (Kartal, Toprak, and Genç Kumtepe, 2018). Especially since nobody has to get away from their surroundings and meet somewhere else. They only come together on the web, in other words in the digital environment. In essence, it is a very economical and time-space independent application. It will probably be very popular except for departments and programs that require practice or face-to-face training. However, educationally and pedagogically, it is thought that it is more appropriate to do this process face to face, especially from kindergarten to the last grade of high school.

Distance education is defined as a form of education that offers a wide variety of educational practices to students and supports all learning styles of normal education

practices without the intervention of teachers or guides (Yalman & Başaran, 2018). Although it is used under different names as distance education, e-learning, or computer-aided education due to needs or possibilities, it can serve a wide variety of fields. Many private, public and nonprofit institutions or organizations offer distance education due to the cost, speed in processing, storing, and transmitting data. It is one of the fastest-growing areas given its impact on social and economic development, its openness, and flexibility. It is an education that generally offers technology-integrated teaching methods to the individual outside of the traditional education environment. It is a process used for students to access learning, information source, etc. regardless of time and distance. For this reason, some universities today can serve approximately 200 thousand students with many departments and programs with the title of "open university" (Türkmen, Aşcı, & Zor, 2020). In general, the Council of Higher Education (CoHE) pointed out that while the total of undergraduate and associate degree students who continued their education life until the 2018-2019 academic year was approximately 8 million, half of these students were open education students (CoHE, 2019).

The pandemic period was affected by the disruption of the education of about 25 million students in Turkey (Booth, 2020). These students continued their education and training processes with distance education. Live lectures, online chats, recorded videos, reading texts, events, and discussion forums were used in distance education. The most important factor that hinders the distance education process is measurement and evaluation. Evaluations could not be made in the first period of the pandemic. In the current period, it is seen that schools will be opened gradually, and this has started. In general, although students do not know exactly what happened during the pandemic period (Dönmez & Gürbüz, 2020), it has been determined that some students see distance or digital learning better during the pandemic process (Bozkurt, 2020). Also, it has been determined that they do not lag behind their education with various applications and can receive online training even from home (Karadeniz, 2020)..

Conclusion and Recommendations

It is known that countries that have accomplished digital transformation in education in the world have climbed to the top in evaluations such as PISA that measure educational results (Akgün, 2019). Because it has been determined that digital learning resources perform many cognitive skills of students (Hover & Wise, 2020). For example, significant differences were determined in conceptual changes with the digital learning dimension (Tseng, Tuan, and Chin, 2010). Also, in the digital learning process, it has been determined that students appreciate digital learning materials and reach their learning goals (Busstra et al., 2008). Apart from these, some results are not clear in terms of the effects of using technology in digital learning processes on students' learning (Harju, Koskinen, & Pehkonen, 2019). Apart from all these data, it is known that studies

on digital learning are quite insufficient in some African countries (Unwin et al., 2010). New studies and applications will be made for digital learning. There are factors that educators and practitioners should pay attention to in the use of digital learning and digital tools.

Most of the information we reach through digital tools can be biased or inaccurate. In particular, pollution of information on the internet is one of the factors that should be considered (Kardeş, 2020). E-government, virtual commerce and social media have emerged with tools that have been acquired or in use thanks to digital transformations (Pala & Başıbüyük, 2020). These digital tools also cause cyber security threats such as identity theft, cyber fraud, cyberbullying and the rapid spread of false-misleading information (Bozkurt, 2020; Thoma et al., 2019). Apart from these, with technological digital transformation, students can be self-centered, materialist, unfaithful, bored and insatiable individuals as well as being at peace with themselves, active on social media, and questioning individuals. It is also important to note that students see digital technologies as a game, socialization, and information acquisition tool, but that they contain risks and threats in terms of deformation of moral values (Alp & Levent, 2020). In addition to all these, it is necessary to determine the causes of disruptions in digital learning, which has an important place in the education of the individual, and to eliminate these problems. As it can be understood from the face-to-face interviews with many teachers, especially during the pandemic process, it has been observed that almost 10% of the class attendees can be taught through distance education. It was determined that the remaining students could not attend the classes due to their disruptions in the network, internet, telephone, computer.

The main causes of the glitch occurring in the digital learning that are being implemented in conjunction with the digital transformation Turkey are listed below:

• *Lack of Internet Access:* Internet providers do not provide infrastructure unless personal applications are received, municipalities and governorships cannot provide technical support and financial means in this regard,

• *Restricted Access Internet:* In many families, the internet is mostly used part-time, it provides access at a certain time of the day, can be accessed even in the home on the roof, mountain or high places

• *Internet:* Although internet line cannot be installed in mountainous areas, it is weakened and worn out in rural areas and does not allow mass access, generally only fiber infrastructure is used in big cities,

• *Network:* Due to the construction of telephone networks by the private sector, there is still a network problem in steep and difficult areas,

• *Parental Perspective:* Lack of digital literacy, such as the fact that many individuals in the family before the 1980s consider telephone features only as communication, computer is a source of information but has concerns about its use, as a matter of fact, the vast majority of this age group only has a telephone,

• *The Trend in the Digital Generation:* Those born after 1980 and especially those born after 1990 are intertwined with technology, can use many technological tools both at home and from their friends, but prefer these technological tools more only for access to social media accounts,

• *Digital Tools:* In general, the presence of smartphones in homes, but the absence of computers and tablets, and the inadequacy of the phone for digital work with computers and tablets. According to the 2019 data it was determined that only in 18% of homes in Turkey have desktop computers, 38% have portable computers and 27% have tablets (Arseven, 2020).

It is known that many people in the society own a telephone. It is estimated that the majority of these phones have internet access. When they are asked to access a digital learning environment with their phones, they can access it with a few simple applications. However, their ability to remain sufficiently in the digital learning environment depends on their internet package capacity. In fact, instead of questioning the availability of telephone and internet in every individual in the society, the availability of sufficient internet packages should be questioned. Undoubtedly, it will be determined that many citizens do not have enough internets. In solving this problem; Internet providers that can be financed by municipalities can be placed in public areas, schools, universities, police stations, mosques, parks and gardens. Thus, the internet problem can be solved to some extent.

The places with old, worn out or completely absent internet infrastructure in the country should be determined and their deficiencies should be completed by public institutions or organizations. Also, telephone base stations should be established, and network problems should be eliminated in difficult to access, mountainous and rugged areas. Afterwards, all relevant infrastructures that will enable the use of digital technologies should be put into service. Finally, it is necessary to provide information on digital technologies and their use in education especially for parents, and introductions and even the training that will help the digital generation young people not to notice only the social media aspects but also the educational aspects of digital technologies.

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