Digitalization in education

Burcu Arısoy [a] [1], Beykent University, Department of Human Resources Management, 34100, Istanbul, Turkey
https://orcid.org/0000-0001-7452-2990

Abstract

This study aims to contribute to the literature on digitalization in education. In the study, a semi-structured interview form is used. The experts working in the educational field in private institutions were interviewed for this study. The study examines the effects of digitalization in education; although there are no specific studies for education departments in the private sector in the literature, it has been seen that the effects of digitalization are similar. The study also shows different factors such as the people's fears about digitalization in education, lack of authentic educational materials, its ineffectiveness compared to face-to-face education, and the scarcity of digital literacy.With digitalization in education, arranging educational content using technological opportunities, creating educational materials combined with virtual reality, and applying gamification in education becomes important in terms of the effectiveness of education.

Keywords ; Digitization, Education, HRM, HRM practices, Working life.

* ADDRESS FOR CORRESPONDENCE: Burcu Arısoy, Beykent University, Department of Human Resources Management, 34100, Istanbul, Turkey
  E-mail address: burcuarisoy@beykent.edu.tr

1. Introduction

With the rapid increase in technological developments, the digitalization of societies has come to the fore. As the effect of technology in every aspect of society is seen, the results of digitalization in working life and education have been inevitable. Companies have to adapt to the digitalized world and to achieve that, they should regulate their working models and human resources activities accordingly.

At the same time, companies have to adapt to rapidly changing technological developments to adapt to changing conditions and cope with unpredictable uncertainties and crises. Some people even claim that the element of competition in the future will be only with education (Porter K etc., 2006). Computer technologies started to dominate in today's world, and manual work has been replaced by smart computers (artificial intelligence). This situation changes people's work, communication, and working models (Halid H, 2020).

On the other hand, it is undeniable that the digital economy has also changed working life. In the last decade, technologies and innovations in broadband connections and cloud computing, besides information and communications, have enabled economic transactions, large volumes of data, and information exchange between individuals, businesses, and devices. In this world of economy, data and the spread of digital platforms in various sectors of the economy have become significant. The COVID-19 epidemic since March 2020 has also contributed to the importance of digitalization with both remote working arrangements and distance education (ILO, 2021).

The Covid process has affected every stage of education, making it necessary for schools to be closed down temporarily in countries, and education was shifted to online. At the same time, the pandemic process has made it possible for the companies to switch to the hybrid model or the remote working model, and employee training to be carried out through digital platforms. Online education platforms, which were not preferred much before the pandemic, have become prominent, thus accelerating the adaptation process to digitalization in education.

The study aims to contribute to the literature on digitalization in education. A semi-structured interview form was used in the study, and the experts working in education in the private sector were interviewed. Questionnaires were sent to the participants by email due to the pandemic process.

1.1. Literature Review

Digitalization in education can be defined as using digital technology to teach students. Digitalization is considered to be an indispensable concept to prepare for the future following industry 4.0 aims. Industry 4.0 and the concept of digitalization are interwoven. The distinctive features of Education 4.0 are transformed education processes such as peer-to-peer learning, critical thinking skills, automated assessment methods, advanced data analytics, and personalized learning (Gupta, 2021).

The digital transformation, which is seen as the fourth industrial revolution, includes the internalization of new skills by individuals as well as technological inventions. Technological developments contain hybridized teaching combined traditional and virtual spaces, allowing for the merging of different online environments. With digital transformation in the flipped class, digital cooperative learning (DCL), gamification, augmented reality, virtual reality, or mixed reality have become prominent in education. At the same time, personalized education, personalization of content, and develop one's own skills are possible in social learning (Segura etc., 2021).

Digital education, also called technology-enhanced learning (TEL) or e-learning, is defined as the creative use of digital resources and innovations during learning. It can also be defined as classrooms that allow teachers to design interactive learning environments in the form of hybrid or fully online programs and courses to explore the use of emerging technology (Suleiman etc., 2020).

During digitalization in education, companies should also implement different learning methods to create behaviors specific to individuals and encourage interdisciplinary learning and computer-based learning methods targeting digital creativity and learning content that provide simultaneity. In addition, due to the strategic role of human resources, it should support the development of employees in post-university education processes and lead employees to adapt to the competencies of the changing world and have leadership competency. On the other hand, human resources should include fast learning methods and be active in establishing digitalization. Although learning tools that implement digitalization are required in today's world, new media, such as e-learning platforms, monitoring digital learning success, and meeting learning needs can help determine the competencies required for big data analysis. Employees also need to learn collaboratively in social groups. For this reason, human resources developers and trainers should also specialize in digitalization (Stein , 2015).

On the other hand, as globalization and rapid developments in technology continue to transform working life, education systems have become more and more disconnected from the needs of global economies and societies. However, in the context of increasing polarization and the needs of labor markets, primary and secondary school systems play a critical role in preparing the global citizens and workforce of the future. Today, non-formal education largely aims to meet the uniform talents needed by the mass production system required in the first and second industrial revolutions. The third and fourth industrial revolutions required the changes that will provide new productivity models for the needs of innovation economies and the necessary skills to create value (WEF, 2019). At the same time, higher education institutions have to adapt to the digital transformation process. The success of digitalization in higher education institutions depends not only on adaptation but also on the usage of the new technologies or the latest tools. On the other hand, the content of the education system should be rearranged to aim at providing the right tools and skills to prepare the workforce of the future (Bozkurt etc. , 2021).

On the other hand, educational content should be adjusted to include distance learning and face-to-face learning. Distance learning with the digitized environment will increase theoretical learning, while the second environment will be beneficial for practical skills. The new skills of the future require education in science, technology, engineering and mathematics, and digital skills (Gupta etc., 2021).

Digitization has both positive and negative effects. Negative outcomes include cyber security, cyber protection, and cybercrime. In this context, individuals should develop their knowledge, skills, and abilities to safely and responsibly use it and learn how to manage and use digital technologies appropriately in society. The online safety of students and individuals is essential in education. As a matter of fact, digital information can be rapidly reproduced, distributed in a manageable way, and stored in various locations (Kapur , 2018).

As in all sectors, new formations are needed in education, where innovation is essential, increasing productivity and improving the quality and equality of learning opportunities. At the same time, training should be created to provide needed skills such as critical thinking, creativity, imagination, and entrepreneurship. Governments should develop the right policies and education strategies based on smart innovation that fosters innovation. On the other hand, a digital gap arises between those with the required skill level and those who do not. While individuals with digital skills have better working opportunities and income levels, others do not have these opportunities (OECD, 2016).

2. Methods and Materials

2.1. Research method

This research was designed in accordance with the qualitative research method. Qualitative research is one of the forms of knowledge production developed by people to understand their own potential and explore the depths of the social structures and systems they have built with their

efforts. In studies designed with the qualitative method, there is an effort to reach a deep perception of the event or phenomenon examined (Morgan, 1996).

2.2. Participants

The participants of the research consist of 20 people working in the private sector as the expert - managers in the field of education.

2.3. Data collection tools

Data collection methods such as observation, structured or semi-structured interviews, focus group interviews, and speech and text analysis are generally used in qualitative research (Forrester and Sullivan , 2018). In this study, a semi-structured interview form developed by the researcher in accordance with the purpose and sub-objectives of the research was used in order to collect qualitative data.

2.4. Data collection process

Firstly, half structured form related to the topic was presented to the experts, then the form was sent to the participants via email due to the pandemic. 5 of the 20 participants were interviewed via Zoom for 30 minutes. The form contains five questions.

2.5. Data collection analysis

The research data were analyzed using the content analysis method. Since content analysis is an inductive analysis type, it focuses on the origins of the investigated phenomenon or event. The concepts underlying the data and the relationships between these concepts are revealed through coding. In qualitative research, the researcher is in an effort to discover the themes related to the problem based on the descriptive and detailed data s/he has collected, to transform the data he has obtained into meaningful and systematic structures, that is, to form a theory based on these data or to verify a theory. In the absence of a theory that can form a basis for the event or phenomenon examined, inductive analysis, that is, content analysis based on coding is required (Baltacı, 2017).

In content analysis, data obtained through interviews, observations, or documents are analyzed in four stages: (1) coding the data, (2) finding the codes, categories, and themes, (3) organizing the codes, categories, and themes, and (4) defining and interpreting the findings. (Eysenbach and Kohler, 2002).

3. Results

In this section, the answers given by the research participants to the questions in the semi-structured interview form are included.

Table 1. Participants' indicators

Participants	Demographic Feature	F	Total	%
Company Structure	National Company	19		95
	International Company	1	20	5
Experience Duration	0-10 years	2		10
	10-15 years	1	20	5
	15 years and above	17		85
Number of Employees in the Company	1-100	4		20
	100-300	4	20	20
	300 and above	12		60

Table 1 shows the demographic structures of the participants. Accordingly, 95% of the participants work in a national company, while 5% work in an international company. While 85% of the participants have 15 years or more experience in working life, 5% have 10-15 years of experience, and 10% have 0-10 years of experience. 60% of the participants work in a workplace with 300 or more employees, 20% work with 100-300 employees, and 20% work with 0-100 employees.

Table 2. Challenges encountered in the digitalization process in education

Category	Theme		Total	
			F	%
	Technological problems	10		
	Financial resources	6		
In terms of companies	Not all educational content is suitable for digitization	2		
	Difficulty explaining the benefit and ensuring active participation	1		
	Missing the app	1	24	63
	Decreased educational efficiency	1		
	Creating original content	1		
	Transition of the trainer to the role of informing with digital education	1		
	Lack of digital content training materials	1		
	fear of people	2		
	Inability of participants to use body language	2		
In terms of Participants	Having to attend training while working at the same time	2		
	People's resistance	1		
	Trouble adapting quickly to changes	1		
	Non-young participants are not close to digitization	1	14	37
	Not knowing the tools used in learning technologies	1		
	Distraction-learning difficulties	1		
	Inequality of opportunity	1		
	Lack of digital literacy	1		
	Participants not listening	1		

In Table 2, "What are the difficulties encountered in the digitalization process in education?" in the semi-structured interview form of the research study group. The answers given to the question were evaluated in 2 categories. In the category of companies, 63% of the participants stated that technological problems, financial resources, not all educational content is suitable for digitalization, difficulty in explaining its benefits and ensuring active participation, lack of application, decrease in educational efficiency, original content preparation, trainer's transition to the role of informing with digital education, digital content stated the problems of lack of educational materials. 37% of the participants are afraid that; they cannot use their body language, and they have to attend the training at the same time while working at work; also people's resistance, the problem of adapting quickly to changes, the non-young participants are not close to digitization, the tools used in learning technologies are not known, distraction-learning difficulties, They expressed the problems of inequality of opportunity, lack of digital literacy, and participants indifference.

"What are the difficulties encountered in the digitalization process in education?" The answers given to the question are given below with direct quotations;

K1; Resistance of people, the difficulty of breaking habits, financial resources

K3; Not every program can be used comfortably by every business and person. People may have internet or technical problems and wants to expose people to both work and training in the business environment.

K9; Education efficiency may decrease.

Table 3. What are you doing to adapt to digitalization in education

Category	Theme		Total F	%
Implementation of Education	Doing training online	5		
	hybrid training	2		
	Creating digital education systems	2	13	65
	online academy	2		
	Preparing training videos	2		
Content of the Training	Keeping track of current changes-adaptation	6		
	organize a workshop	1	8	40
	Developing various projects	1		
	Digital education platform	2		
Educational Technologies	Use of digital technology	1	4	20
	Using technological tools	1		

In Table 3, "What are you doing to adapt to digitalization in education?" in the semi-structured interview form of the research study group. Their answers to the question were evaluated. In Table 3, the research participants' "What are you doing to adapt to digitalization in education?" The answers given to the question were evaluated in 3 categories. 65% of the participants stated that they do online training, hybrid education, creating digital education systems, online academy, and training preparations in the education application category. In the category of training content, 40% of the participants stated that they follow up and adapt to existing content, organize workshops and develop various projects. In the category of educational technologies, 20% of the participants stated the digital education platform, the use of digital technology, and the use of technological tools as those done to adapt to digitalization in education.

"What are you doing to adapt to digitalization in education?" The answers given to the question are given below with direct quotations;

K2; We have a training platform that consists of a large pool in the digital environment and that all our employees can access from anywhere at any time.

K4; We organize educational programs with hybrid learning journeys. We reinforce learning with online solutions via LMS

K15; With hybrid systems, we move away from the classical education approach and develop various projects within the scope of accessibility to education.

Table 4. Effects of digitalization on education

Category	Theme		Total F	%
Savings Effect	Time - independent access	11		
	Saving time	2		
	cost savings	1	14	70
	Opportunity Equality	4		
	Increasing the number of trainees	2		
	Measuring efficiency from a single point	2		
	Reaching large audiences	1		
Effect on Participants	Compliance with personal learning pace	1	13	65

Category	Theme	F	%
	Participants being active in the learning process	1	
	Increasing the motivation of the participants	1	
	Increased development of people	1	
	Accessibility	6	
	Digitization of education	1	
Impact on Educational Content	Increasing the number of education	1	
	Adaptation of educational content to digital education	1	12
	Increasing gamification in education	1	60
	e -learning content	1	
	Increasing access to education	1	

In Table 4 , "What are the effects of digitalization on education?" in the semi-structured interview form of the research study group. The answers given to the question were evaluated in 3 categories. In the saving impact category of 70% of the participants, time and location-independent access, time, and cost savings statements are included. 65% of the participants stated that equal opportunity in the category of impact on the participants, increase in the number of participants in the training, measuring efficiency from a single point, reaching large audiences, suitability for personal learning pace, being active in the learning process of the participants, increasing the motivation of the participants, increasing the development of the people. 60% of the participants stated that in the category of impact on educational content, Accessibility, Digitalization of education, Increase in the number of training, the adaptation of educational contents to digital education, increase in gamification in education, increase in e-learning content, increase in access to education.

"What are the effects of digitalization on education?" The answers they gave to the question are given below with direct quotations;

K1; Speed, Time-saving, Online development of people, redundancy, accessibility

K6; It provides the opportunity to learn independently of time and place. Creating equality of opportunity to be suitable for personal learning pace

K7; Positive aspect is to be able to access training on different subjects when accessibility becomes easier to decrease in travel expenses

Table 5. Negative effects of digitalization on education

Category	Theme	Total F	%
	The indifference of the participants – Concentration problem	5	
	Lack of trained workforce	2	
	Cognitive – Physical difficulties	2	
Effect on Participants	Detachment from the learning experience	1	14	70
	learning difficulty	1	
	Lack of original ideas	1	
	ease	1	
	Increasing individuality	1	
	Lack of interactive face-to-face education	5	
	Decreased efficiency in events	4	
Impact on Educational Content	Difficulty performing practice-oriented activities	2	12	60
	Increasing cyberbullying	1	
	Not as effective as face-to-face training	3	
The Effect of Education on Efficiency	Measurement problem of training results	1	5	25
	Cheating tendency in education exam	1	

In Table 5 , "What are the negative effects of digitalization on education?" in the semi-structured interview form of the research study group. The answers given to the question were evaluated in 3 categories. In the category of impact on the participants, 70% of the participants stated that the participants' indifference – focusing problem, lack of trained workforce, cognitive – Physical difficulties, distance from the learning experience, learning difficulty, lack of original ideas, simplicity, and increasing individuality. In the category of impact on the training content, 60% of the participants stated that the training does not take place face-to-face interactively, the efficiency decreases in the activities, the difficulty in performing the practical activities, and the increase in cyberbullying. On the other hand, 25% of the participants stated that it is not as effective as face-to-face education in the category of contribution to the efficiency of education, the measurement problem of education results, and the tendency to cheat in the education exam.

"What are the negative effects of digitalization on education?" The answers given to the question are given below with direct quotations;

K3; I think that it is not as effective as face-to-face training processes. Although the participants are comfortable from home, etc. Although they participate in the other system, its effectiveness is more than me.

K8; There is no one-on-one interaction. Team interaction does not occur in training that requires games and activation, such as teamwork.

K16; Pros of active communication (body language, emotion, etc.) and can hinder effective learning

Table 6. Definition of digitization

Category	Theme	Total	
		F	%
Technological Opportunities	The training not face-to-face, physically together, but through digital platforms, using technological opportunities.	1	
	Classical education in an environment where redundancy and accessibility are provided , supported by technological tools, and the use of online platforms for people to receive education independently from place to place.		
	Automating the steps of all training processes such as reporting, tracking, planning, and demand collection, enriching the subject and practice areas with appropriate technologies according to the training content	1	
	Technological possibilities of gains created in the student using	1	
	New technological arguments in the educational process	1	
	Transfer educational materials to digital media and transfer training from digital platforms to students. The widespread use of virtual reality and augmented reality in education. Using artificial intelligence in educational processes.	1	12 60
	With the increasing technological developments and the intensive use of information technologies, the information is actually transferred to the electronic environment.	1	
	A 360-degree process that affects all education processes and updates education transfer methods.	1	

	An electronic environment that enables distance education to spread easily, quickly, equally and to wider audiences.	1		
	Ability to take required or compulsory training online or offline	1		
	Online communication, video	1		
	The widespread use of virtual reality and augmented reality in education	1		
Easy access	Individuals can easily access all kinds of training documents, trainers, and training from wherever they are	1		
	Change in the way information reaches the participant in the education	1		
	education topics and providing online access to participants	1		
	The freedom to access any education and information source they want, regardless of place or time.	1	8	40
	Training prepared in the digital environment that is easy, fast, cheap, and enables them to reach wider audiences.	1		
	Sharing existing content over systems that people can access at any time	1		
	Easy access to information, easy sharing	2		

In Table 6, "Can you explain digitalization in education?" in the semi-structured interview form of the research study group. The answers given to the question were evaluated in 2 categories. While 60% of the participants answered the question in the category of technological possibilities, 40% answered in the category of easy access.

4. Discussion

It is seen that studies on digitalization in education are handled from different perspectives. As a matter of fact, while some studies deal with digitalization in education in the context of primary education high school university at the national level, it is seen that companies in the private sector take it in the context of human resources practices. In addition, it is seen that there is no clear definition of digitalization in education. It is seen that the concept of digitalization in education and industry 4.0 are intertwined.

Industry 4.0 has brought the importance of artificial intelligence and replaced some professions with robots or machines with robotic intelligence. At the same time, easy access to information and storage of information has gained importance. Similarly, there is a need for teachers who adapt to change, have digital literacy, are good with technology, and improve themselves. With digitalization, there is an opportunity for education regardless of time and place (Sürer 2020).

On the other hand, the digitalization of education is inevitable today. Information technologies eliminate the shortcomings and enable distance learning, which is cheap, useful, and high quality. Digital learning is becoming an important part of our lives; the digitalization of the educational environment and especially digital learning are important. In this context, teaching staff should be retrained to be integrated into digital education (Shushara etc. , 2021).

At the same time, future teachers need to be taken into account when designing the education process; They should have reliable and objective ideas and design the education process in accordance with digitalization. Space digitalization methodological approaches should be developed and combined; comprehensive studies should be carried out in pedagogy, age psychology,

physiology, hygiene, and the characteristics of the digital generation should be taken into account. Teachers of the future should develop themselves to meet the educational needs of the future. In this context, the digitalization methodology of education should be fast and based on monitoring (Morozova). etc. , 2019). In addition, most learning styles are being transformed, and digital education is becoming widespread through social networks. In the future, it will be possible to work with e-learning via Facebook as it is interactive and easy to access (Islam etc. , 2018).

The realities of digitalization require changes in the strategies for choosing educational technologies. This modern educational process is not possible without the use of digital technologies. Although digital technologies lead to the emergence and development of blended learning, digital competence is also required in the use of these technologies. It increases future professionals' information and data literacy, communication, cooperation, and problem-solving competence. In addition, the most popular digital competence areas that enable students to participate in blended learning are information and data literacy, communication collaboration, problem-solving (Bykova etc., 2020).

Increasingly widespread digitalization is also supported by countries in the world today. As a matter of fact, countries apply a series of measures to specialize in digital technologies. Despite the successful implementation of digitization, national economies face many problems when reforming education. Especially the digital inequality among people and limited access to information in terms of communication technologies are among these problems. In this context, countries should examine the digital education system and transform the national education system (Gapsalamow etc., 2020).

Digital education is also important in higher education. As a matter of fact, for this institution, digitalization provides more opportunities than formal education and classical learning education methods and tools. Higher education institutions have access to further contact information, synchronous and asynchronous learning, increasing cooperation and cooperation, cost-effectiveness, and pedagogical improvement with the issue of digitalization (Parlak, 2017).

It is seen that the effect of digitalization on higher education is positive. Especially, the positive effect of education on economic growth (sustainable development) is observed. Strong investments should be made in digitalization and new technologies in e-learning. However, distance education is not fully recommended due to difficulties in teaching, student understanding, and student evaluation (Toader etc. , 2021).

On the other hand, digital education communication has certain risks for students. Digitization can also significantly impact the physical parameters of education, and problems that affect health, increasing "screen time", creating addiction, vision and musculoskeletal system, and healthy lifestyle skills can come to the fore. In addition, problems may arise in the student's characteristics, such as being able to work in a team, leadership, respect for people, empathy, and responsibility. When considered in the context of information security, personal cyber attacks, and cyber fraud are among other problems (Baeva . etc. , 2020).

Other risks created by digitalization are that individuals differentiate their values and create integrated individuals in remote virtual environments. On the other hand, the phenomenon of addiction, the loss of the social identity of individuals, and the change in education's identity are among the effects of digitalization. As a matter of fact, it is seen that digitalization is widespread from pre-school education to higher education. Digitalization in education changes how individuals think, produce, write, and develop (Radmard etc., 2019).

There are different studies in the literature on digitalization. Some authors have examined the effects of digitalization on students and teachers in primary, high school and university education. Some authors have investigated how well students and teachers adapt to the digitalization process. On the other hand, there are also authors who examine the digitalization process of human resources functions. However, in our study, the effects of digitalization in education were examined, and

although there are no studies for education departments in the private sector in the literature, it has been determined that the effects of digitalization are similar.

5.Conclusion

In the study, the effects of digitalization in education have been examined, and although there are no studies for education departments in the private sector in the literature, it has been determined that the effects of digitalization are similar. The study determined the fears of those who will participate in the training about digitalization, the lack of original training content, the ineffectiveness of face-to-face training, and the scarcity of digital literacy. It was also stated that those working in education in the private sector created online education platforms to adapt to education and digitalization, edited their educational content and videos in this context, and used virtual reality applications. Access opportunity independent of time and place, equal opportunity, increasing access opportunities, saving time and space were other points emphasized by the participants.

6.Recommendations

The study was carried out to contribute to this context, where there was no specific study on this subject before in the literature. It can be said that the educational institutions of the organizations that digitalization in education is an undeniable reality have to adapt. Although the importance of the concept is increasing in the process we are in; it seems too early to say that education should be completely digitalized. As a matter of fact, the participants' opinions are that digitalization in education will increase, but face-to-face education will not completely disappear. Along with digitalization in education, arranging educational content using technological opportunities, creating educational materials combined with virtual reality, and applying gamification in education gain importance in terms of the effectiveness of education. In addition, besides the digital education content organized only for those working in the private sector, the practices made in the sector can be taken into account in order for national education and higher education institutions to adapt to digitalization. Thus, an education system and working life integrated into digitalization will be in question. This will bring along a qualified, competent workforce and an efficient and effective working life that has adapted to the age requirements.

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