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ACADEMICIANS' VIEWS ON DIGITAL TRANSFORMATION IN EDUCATION

Research Article

Aydın Balyer

Yildiz Technical University, Turkey

balyer@yildiz.edu.tr

Ömer Öz
Hasan Kagnici Primary School, Ministry of Education, Turkey
omeroz84@gmail.com

Dr. Aydın Balyer is an associate professor in the field of Educational Administration at the Department of Educational Sciences at Yıldız Technical University. His research interest focuses on school leaders, principals, their professional development and working conditions. He also studies on educational policies in which school administration is researched in detail.

Omer Oz is a vice principal at Hasan Kağnıcı Primary School, İstanbul / Turkey and graduate student at Yıldız Technical University, Turkey. His research interest includes Educational Management, Distance Education.

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Aydın Balyer

balyer@yildiz.edu.tr

Ömer Öz
omeroz84@gmail.com

Abstract

It is seen that changing information and communication technologies affect and even transform things in almost every area of the digital age that we have in conjunction with Industry 4.0 and globalization. These rapid changes and transformations in the world affect education both as a structure and as learning environments. One of these values has been the digital transformation. As the increasing use of technology in every day and learning environments, now most of the students are born to a digital world. In this context, this study was designed with a phenomenological research design as the qualitative approach in order to determine academics' views on digital transformation in education in terms of program and management processes. The working group consists of 20 faculty members working at 9 different universities in the Department of Educational Sciences. The data were collected with a semi-structured interview form. Results reveal that in the digital transformation process, managers must first create a vision to generate and managed accordingly for an effective learning environment. According to another result, it is possible that school shareholders are involved in this transformation process by letting them access the place and time by supporting content and infrastructure which is technologically appropriate. It is recommended that educational administrators and program specialists be ready for this transformation and have the qualities to manage this transformation.

Keywords: digital transformation, educational management, 21st century pedagogy, technology.

1. Introduction

In the 21st century known as the digital age, with globalization, structures in almost every area is influenced rapidly by developing and changing information and communication technologies. It is impossible for education to remain insensitive to these developments and changes.

Thanks to the rapidly developing information and communication technologies, digital tools used in educational settings are also increasing and changing in this direction (Parlak, 2017). It is inevitable that there is a digital transformation in education as a result of the use of increasing technology in everyday life (Taşkıran, 2017). It is necessary to develop this transformation, the digital era and the ability to understand and adapt, to design our education system, which is still dominated by classical understanding, in accordance with today's conditions (Parlak, 2017). It should be emphasized how the change and transformation should take place in this context and it is appropriate to draw the general framework for our educational system in line with the needs of the changing learning profile.

In the last 20 years in our country, various technological improvements have been made to integrate the use of technology in education and training, to facilitate learning for teachers and students, and to improve technology literacy (Arık, Arslan, Çakır & Kavak, 2016). The Fatih project, which is currently being implemented in schools affiliated to the Ministry of National Education (MoNE) since 2011, is one of these studies.

Digitalization is one of the important elements of the age we are in. Developing countries seem to fall behind in these issues when concepts such as the internet, large data, coding, and smart factories are evaluated by digitalization and objects called the fourth industrial revolution (Industry 4.0) (Parlak, 2017). Bates (2015) Industry 4.0 for the new skills and learning processes of the digitizing world emphasizes education that is appropriate to the needs of the economic order and the market that are shaped through digital technologies defined as " In this context, it is seen that our education system is not working in line with these concepts, the classroom environments are the same as those in the past years, today's learning needs are overlooked and they are partially away from digital technologies. In this direction, the problem of studying how the digital transformation in education can be realized in the context of management and education programs constitutes the problem.

1.1. Purpose of the Research

The purpose of this study is to determine the views of academics on digital transformation in education. In this context, the answers to the following questions were searched:

1- What are the views of academicians on how Digital Transformation will take place in education?

2- What are the views of academicians on how digital transformation will take place in the context of management of education?

3- What are the opinions of the academicians on how the digital transformation will take place in educational programs and teaching contexts?

2. Literature Review

The concept of globalization led to the 1980s, when significant American universities such as Harvard, Stanford, and Columbia started to be used in business schools, and because of the economic, political and technological dimensions of globalization (Coşkun, 2003). According to Nilsson and Bergh (2010), globalization is a process that is closely integrated with different economies and societies, and emerging simultaneously with the increasing use of communication technologies around the world. Globalization, with the global economic, political, cultural integration and the global use of ideas, views, technologies, the universalization of capital circulation, the emergence of new forms of interaction which transcend national boundaries, the convergence of places, the downsizing of the world, free movement, it can be expressed as the becoming the worlds' single market (Balay, 2004; Kaçmazoğlu, 2002). Considering these definitions, it is seen that two different issues have come into prominence in globalization; economy and technology.

As it is understood from the definitions, globalization is a multidimensional concept, and it can be expressed as a process which shaped the result of transformation of these varied dimensions. We can express these dimensions as globalization in economic, political, cultural and technological dimensions in general terms.

With the globalization of the technological dimension, the increasing prevalence of knowledge, rapid developments in technology have begun to change the society and therefore the economy. Furthermore, with the renewal of information and communication technologies and the widespread use of these innovations in different fields since the 1980s, the meaning of

space and distance in the world has been lost. With globalization and new technologies used by developed countries, production has spread rapidly and widely. Although this shows the first effect in the context of globalization in the economy, it is now spreading from politics to culture and from trade to a much wider area (Çelik, 2012).

Developments and innovations in technology over the past 20 years give us the opportunity to access time and space without any hassle. Considering the possibilities offered by technology for social and economic development, it is considered appropriate for the stratum of globalization to come into the technological dimension to be called "digital age", "information age", "information society" (Özden, 2013).

Nowadays that we live in the information age, there is a multidimensional transformation in the structure of individuals and societies. The source of knowledge has changed hands, and teaching and learning activities have begun to differentiate from traditional approaches (Bozkurt, 2015), as the dependence of individuals on outsourcing for information access decreases. It can be said that the changes that took place in the information age, the effects of globalization and technology, necessitated changes and improvements in education systems, approaches, and processes. While the developments in information and communication technologies show that education can be done outside of schools, lifelong education is always on the agenda everywhere and every time (Şişman, 2016). Today, while the information -with the information and communication technologies- removing the borders around the world along with fiber optic cables, it has begun to change both the form and the presentation of education and learning. Instead of the teacher-centered approach to education, the adoption of the student-centered approach to education and the learning to learn are all parts of these changes. Also, distance education, computer education, computer-aided education, online learning (e-learning), virtual learning environments etc. may be indicative of the new dimensions of education in developing information technologies.

Today, producing knowledge has a great importance as well as acquiring knowledge. It seems that the success of the individual, the institution or the society depends on the activity of producing and using information. The increase in the use and production of knowledge places societies into a necessary transformation. One of the most important events in history is the industrial (industrial) revolution which has the potential to transform society.

While the first industrial revolution refers to the mechanization of production with the use of production machines from the second half of the 18th century, the increase of the production capacity of the machines with the change of the energy type used in the production tools and the start of mass production state the second industrial revolution, and the development of technology, the spread of computers, and the start of information technologies and automation, the quantification of production represents the third industrial revolution. Nowadays, the 4th Industrial Revolution which is recognized with the development of internet and network, the communication connection between the machine, the increase of communication technology, machines' becoming smart and self-directed ones is stated as smart production (Baysal, 2015; Yazici & Düzkaya, 2016). In today's information age, the factors that transform society, economics and other fields are seen to be the effects of the fourth industrial revolution (Industry 4.0). The stages of the industrial revolutions are shown in Figure 1.

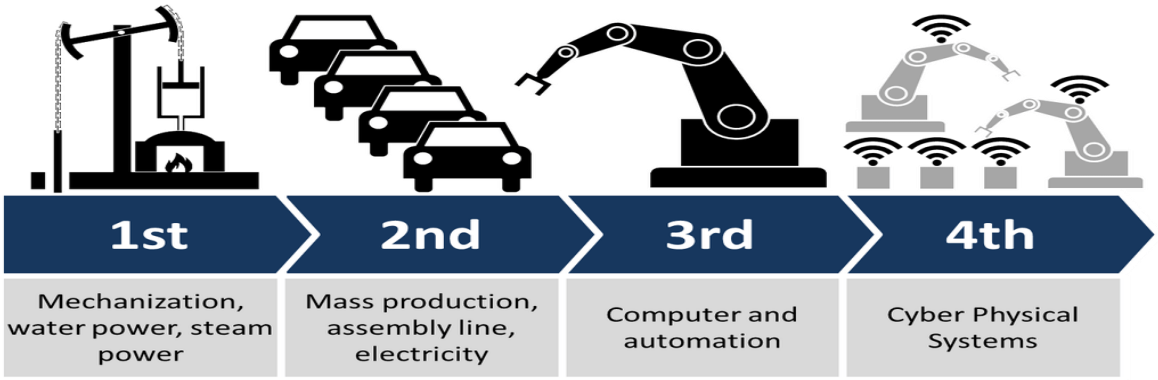

Figure 1: Four stages of the industrial revolution

Industry 4.0 emerged when industrial machines began to manage themselves and their production processes without ever needing human power. The machines are made up of hybrid technology created by the combination of computer, communication and especially internet technologies (Önday, 2017). In this context, the industry is targeting a situation in which the decision mechanism is often left to the machines (TOBB, 2016), with the development of the industry, the procurement of raw materials, the process of production, production and delivery to the marketplace, people, machines and different technologies. It is normal for today's conditions that the input and output are taken from the society and the collective education system is also forced to turn into the direction that Industry 4.0 is aiming at.

Klaus Schwab, the founder of the World Economic Forum (WEF), describes the emergence of the fourth industrial revolution by linking three fundamental factors. These are (Schwab, 2016, p.11);

Speed: New technologies that are connected to each other and are very versatile move quickly at an exponential speed, triggering each other.

Width and Depth: Digitization speeds up the industry 4.0. However, the increase in technology diversity in the industry has brought about the change.

System Impact: Industry 4.0 is expected to undergo a total change as digital industries, companies, and even countries.

With Industry 4.0, many current business worlds have begun to transform the competition and production power of companies and even countries, leading to changes in ongoing applications. It is possible to collect these movements into four main headings (Önday, 2017, p.56).

Regional trends - Increase in social interaction and trade between countries,

Economic trends - Increasing globalization with rising emerging strong economies and financial flows,

Technological trends - increasing internet use and the development of internet technologies,

Meta flows - concerns about scarce resources, the environment, and safety.

It is possible to identify these trends with the dimensions of globalization. As a result of increasing globalization and technological developments, these trends set the stage for systems in which production tools are interconnected by different sensors or the internet and information technologies. Thus, interconnected manufacturing machines can interact with each other via internet protocols in a structure called cyber-physical, errors can be predicted and data can be analyzed. In the industry 4.0 period, these structures will become more widespread

and a structurally faster, more flexible and efficient production process will be provided (TÜSİAD, 2016).

Since the goal of the Industrial Revolution is to make the production process more efficient by means of self-managing technological tools, the intelligent factories that have this production process are the forerunners. In order to create these smart factories, we can list the ten technological elements that triggered Industry 4.0 as follows; three dimensional printers, internet of things, smart factories, cyber-physical systems, big data, intelligent robots, simulation, vertical and horizontal system integration, augmented reality and cloud computing system (Fırat and Fırat, 2017; Hermann, Pentek & Otto, 2015; Önday, 2017). Among the elements that triggered the Industry 4.0, while three dimensional printers, internet of things and robot kits used as course material in face-to-face training, it is seen that in distance education the simulation, augmented reality, big data and cloud computing have been used in recent years. The possibilities such as the use of these elements in educational environments or the presentation of education on the internet or web-based can be expressed as indicators of digital transformation in education.

It can be said that Ministry of National Education (MoNE), is the supreme public enterprise in Turkey with the center, county and organizations, schools and the ministerial units (Bağlıbel, Cetin, Özmant & Samancıoğlu, 2015). According to the statistics of National Education, MoNE provides service to 23,004,320 students and 1,102,031 teachers (MEB, 2017). There are three main e-government applications used by all official and private institutions of the MoNE in order to provide the necessary and sufficient services for these students and teachers: Ministry of National Education Data Processing Systems (MEBBİS), e-School and e-Non-Formal Education. Apart from these, there is an interactive content service like Education Information Network (EBA) and an e-Curriculum project in which pilot studies are conducted during this period.

MEBBİS is the institutional automation and e-Government application used for the management of educational resources of organized and non-formal education institutions under the coordination of the Ministry of National Education. There are many modules such as assignments, personnel information, mobile teaching, paid teacher assignment, guidance, budget management etc.

E-Okul is a system in which education-training institutions and student processes in schools are conducted in an electronic environment and information is stored. There are different modules for teachers, students, and parents on this system. It is an electronic media in which student grades and absenteeism is entered, general and specific information about the school is included, reports are made, and even where parents can get information about their children.

The E-Yaygın Automation System is another e-Government application that has been used since 2008 for the coordination and management of lifelong learning activities. All centers and vocational education institutions providing non-formal education service like the Public Education Directorates, use this application.

EBA is a web-based learning center designed by the General Directorate of Innovation and Educational Technology, developed for the content of the Action for Increasing Opportunities and Improving Technology (FATIH) Project, for the use of effective materials using educational technology equipment in the education and training process. Teachers and students from each school in Turkey meeting under the roof of EBA, a social platform, have the opportunity to exist in a teamwork by collaborating with their peers. E-contents in EBA include students with different learning styles, and it also has a facilitative feature within the transition from teacher-centered education to student-centered education (EBA, 2018).

The FATIH project, which has been implemented since 2011 in the Turkish Education System, is a major project that can exemplify digital transformation in education. Fatih Project is a project which was started with the aim of equalizing the opportunities in education and enhancing the technology at schools with the purpose of efficient usage of equipment of information technology in order to appeal more sense organs during teaching-learning process. In education, the FATIH project will finance the provision of equipment, the delivery of broadband internet to all classrooms, the provision of e-content for lectures, the integration of teachers' information technologies and the establishment of web platforms for content development and implementation of project implementation support.

3. Methodology

3.1. Research Design

This study is a phenomenological research to determine the views of academicians on how digital transformation in education takes place. Phenomenological researches may not reveal generalizable situations, but they can provide examples, explanations and experiences that will help to a phenomenon identified and understood better (Yıldırım & Şimşek, 2013).

3.2. Study Group

The working group of the research is composed of academicians from nine different universities in the Department of Educational Sciences. In this context, the study group consists of a total of 20 academicians from the Curriculum and Instruction Department, Educational Administration, Psychological Counseling and Guidance and the Computer Education and Instructional Technology Department. The sampling of the sample is used for easy selection. This method allows the researcher to select a situation that is close and easy to access (Yıldırım & Şimşek, 2013). The personal information of the participants is given in Table 1:

Table 1. *Demographic information of participants.*

Variables		**f**
Age	30-40	11
	41-50	5
	51-+	4
Gender	Female	9
	Male	11
Seniority	1-10	9
	11-20	4
	21-30	3
	31-+	4
Management Task	Yes	7
	No	13

3.3.Data Collection

The research data was collected by semi-structured interview technique. The literature search was done, and expert opinion was consulted to determine interview questions. A preliminary interview form was formed from the interview questions and a final 3-person group form consisting of experts was given to finalize the form.

3.4 Data Analysis

The interviews with the academicians were reviewed by voice recording and by put voice recordings in writing. According to the order of interviews, academicians are coded as A1, A2, A3 and so on. The data collected as voice recordings were first written in the computer environment and then analyzed using content analysis from qualitative research techniques.

The answers given by the academicians to each question were grouped and interpreted in terms of their similarity, and some answers were presented in the same way. The interview forms were given to the volunteer teaching members who wanted to participate in the study and the answers they gave orally were recorded one by one, the records were solved, grouped and evaluated.

4. Findings

This section includes findings and interpretations of the survey and interview results.

Opinions about how to create and manage a vision for academics to create an effective learning environment in the Digital Transformation

The themes set out in line with the views of academics on how to create and manage a vision to create an effective learning environment for digital transformation are shown in Table 2.

Table 2. *Views of academicians on how to create and manage a vision to build an effective learning environment in a digital transformation*

Themes
Education
Infrastructure
Leadership
Collaboration with shareholders
Conceptualisation
Content
Openness to Change
Support Services
Faculty of Education
Teacher Training
Ministry
Learner-Centered
Policy
Pedagogy
Innovative Learning Environments

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A15: "As learning environments are redesigned for digital transformation, the characteristics of the changing generation must be well understood."

A3: "The infrastructure must be set up, personnel should be trained, and a consultative unit should be established."

A4: "Starting point should not be technology but pedagogy."

A7: "The digital transformation needs to be understood and internalized."

In view of academicians' opinions and determined themes, academicians' opinions about vision formation and management are combined with education from the elements that will form the vision. It is emphasized that the most important part of the education is the students, teachers, and administrators have to take necessary training for digital transformation. With education, digital transformation needs to be conceptualized and internalized. They emphasized the necessity of providing suitable infrastructure. In the development of the infrastructure and the development of the digital contents, learning environments suitable for the partnership and learning characteristics of the shareholders are important, and participation

of the shareholders is important in creating the vision. The academicians, who stated that to be able to work the vision it is necessary to start applying the studies in the process of teacher training in the education faculties, stated that the facilitating effect of learning digital items – provided that being primarily pedagogy centered- should be shown in practice.

It is also stated that to be leaders who have a vision of digital transformation both at ministerial level and institution management, will facilitate the management of the vision. Stating that the support services to be provided during the digital transformation process will facilitate the adaptation of teachers and students, academics have expressed the need for relevant educational policies for the design of innovative learning environments and for the transformation of schools.

Views of academics on how to involve shareholders and society in the Digital Transformation Process

The set of themes set out in line with the views of academics on how to involve shareholders and society in the digital transformation process are shown in Table 3.

Table 3**.** *Views of academics on how to involve shareholders and society in the digital transformation process*

Themes
Education
Persuasion
Strategic planning
Participation in Decision Making Process
Parent Information
Individual Needs
Cooperation
Model Application
Self-Involvement
Young Population
Prospective Teachers
Leadership

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A8: "I think schools should go public (parents), and technology literacy pilot studies will be effective. Where is the output going or where does it come from, how digital items can be looked at and should communicate with the shareholders who provide digital service, especially the municipalities can support it. "

A5: "Firstly, it should be emphasized that should get all shareholders' opinions in the analysis phase and a common roadmap should be determined. Long-term Strategic Development Plans in Education should be done and there should be plans based on scientific evidence of impact worth not being affected by political changes. "

A4: "The digital transformation can be achieved through the involvement of all segments of society, only by the feeling of the need of the individual. In other words, every individual who sees digital processes as making their own work or relations with the state more comfortable and easier to communicate with institutions will be part of this process. "

In the direction of academicians' opinions and determined themes, academicians stated that strategic planning should be done firstly in order to include shareholders and society in the digital transformation process. This meant that shareholders and society need to be persuaded first with effective leadership, and then technology literacy should be improved, in which necessary training should be given. The academicians who stated that both the teachers and the

educators need to increase the competences of the educators with the relevant training stated that the parents should be included in the process and even the parents should be taken to the school and the informing activities should be done and they should see that this is a necessity. Shareholder and community involvement in the decision-making process is crucial for the adoption of the digital transformation, and it is stated that a business association must be established. The municipalities indicated that they could get support for the business association. Stating that shareholders and collective practices should be shown or should be done, academics stated that it would be more effective to engage these efforts with younger populations, that is, with digital natives, and start with education faculties. An academician;

A13: "Today, when all applications and events are almost digitized, the next generation will naturally do it. It is assessed that the process will develop spontaneously."

He stated that the participation in the process will develop by itself.

Opinions of Academicians on How Will be Created a Digital Transformation Culture and How Will be Provided Learning in this Culture

The themes set out in the view of how academicians will create a digital transformation culture and how to provide learning in this culture are shown in Table 4.

Table 4. *Opinions of academicians on how will be created a digital transformation culture and how will be provided learning in this culture*

Themes
Education
R & D / Project
Social Requirements
Digital Natives (X and Y generations)
Strategic Planning
Leadership
Trace and Evaluation
Responsibility
Kindergarten / Primary school
Manager / Teacher / Student
Conscious Consumption
Responsibility
Social media
Reward / Encouragement

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A12: "First, the managers in the institution should adopt this culture, educate the teachers on this issue, and inform the parents and students. Teachers should guide students in digital learning environments, follow the learning process of learners, give feedback and make up the deficiencies. In the meantime, the process should be evaluated together with the school management to determine whether the transformation is going as planned. "

A14: "The way to build this culture is to increase the competence to use digital tools and guide shareholders on their use."

A8: "We can say that children have this culture, and most of the children use better digital technologies than teachers. To be able to create a transformation culture, it is necessary to work in the X and Y generations because the Z generation has done it. "

Views of academicians and views on how digital transformation culture is to be formed in the direction of determined themes and how to carry out learning in this culture should be combined with education in particular and that the research and project work should be done from kindergarten and primary school. Furthermore, academicians who stated that parental information and in-service training should be done continuously, also stated that they should act in the direction of strategic planning for digital transformation. They said that there should be effective leaders who will make an evaluation on the issues such as the monitoring and evaluation of these training, the contribution of education to the school and the level of the teacher's benefit from. It is also appropriate for leaders to provide incentives and rewards. They stated that improvement of director, teacher, and students in conscious consumption, technology literacy is important and responsibilities should definitely be given. Besides conscious consumption, becoming producing individuals and producing technology is efficient in comprising of culture. In addition, academicians who stated that digital transformation examples were seen in e-government applications in various public institutions and organizations expressed that this process was already experienced through digital natives. It is also stated that the use of social media will also be effective in the formation of cultures.

Opinions of academicians on how to ensure that all learners get to know where and when they want to learn

The themes set out in the view of how academicians will construct a digital transformation culture and how to provide learning in this culture are shown in Table 5.

Table 5. *Opinions of academicians on how to ensure that all learners get to know where and when they want to learn*

Themes
Distance Education
Infrastructure
Content
Education
Student-Centered
Information and Communication Technologies
Internet Technologies
Face-to-face Education

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A15: "Distance learning platforms, mobile learning platforms are available."

A8: "I think technology and face-to-face training should be planned together. A budget needs to be set for sustainability. A feature of the audience, the status of the parents are important in the fields of sustainability and repeatability. "

A4: "This process is being carried out effectively with many software today."

A11: "It is possible with the qualified use of existing ICT facilities. It can also be achieved through self-awareness and self-questioning, that is by creating responsibility for learning in the individual. In addition, parents and teachers should be trained in this regard. "

The academicians who stated that the desired place and time of learning is the field of distance education in line with the opinions of the academicians and the determined themes, they stated that the infrastructure should be suitable for this. Recently, MOOC (Massive Open Online Courses) applications have increased in this context. Because development of proper

infrastructure which is student-centered necessitates using the various software, web 2.0 tools, Internet and Information Technologies and effective and active use of these by the shareholders will be via the quality education given to the manager, teacher, and students.

The academicians, who stated that technology is only a tool for learning, also stated that content is very important for learning. In addition, academicians have expressed a positive opinion on the matter that sustainability depends on the government aid, repeatability and scalability depend on the budget.

Opinions of academicians about how to optimize the learning for each student and how collaboration, creativity, and production are supported

The themes set out in the view of how academicians will construct a digital transformation culture and how to provide learning in this culture are shown in Table 6.

Table 6. *Opinions of academicians about how to optimize the learning for each student and how collaboration, creativity, and production are supported*

Themes
Assessment and Evaluation
Student-Centered
Distance Education
Relationship with Everyday Life
Curriculum
Instructional Technologies

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A18: "We need to recreate the definition of the learner and we need to get rid of the industrialization-influenced curriculum and produce a program that is blended with our own culture to match the characteristics of the information society. Otherwise, the school and society will get away. "

A4: "At the core of learning optimization lies a performance-driven approach, which is why training processes in the digital environment are now structured in a way that provides short, key information with mobile tools."

A17: "In this respect, the most important thing that it can be started by determining the student's individual relevance to digital transformation. There are students who have a remarkable ability to design and modeling. They can also reach other students via these talented students. "

In accordance with the views of the academicians and the themes set out, the academicians state that each student should be recognized in terms of their learning orientation, personal characteristics, etc. in order to personalize the student. Emphasizing that the applications to be done should also be student-centered, academicians expressed the importance of planning well and ensuring the goals of education. The academicians who emphasize the significance of the assessment and evaluation process stated that for the optimization students should be made to perform tasks such as performance tasks, product development, , and process evaluation. They also stated that it would be appropriate to support the student-oriented activities with technology and to facilitate access to distance learning activities and learning. Academicians have stated that learning should be associated with everyday life and that it is appropriate to implement teaching activities such as programmed instruction and small steps principle for this. They also pointed out that approaches such as artificial intelligence, learning analytics, educational data mining, which are used in the field of teaching with digitalization, have begun to use in recent years, optimizing learning.

Opinions of Academicians on How to Make a Positive Change in Teachers and Administrator and How to Create Policies to Improve Capacity of Teachers and Administrators

The themes set out in the view of how academicians will construct a digital transformation culture and how to provide learning in this culture are shown in Table 7.

Table 7: *Opinions of academicians on how to make a positive change in teachers and administrator and how to create policies to improve the capacity of teachers and administrators*

Themes
Educational Policies
Salary
Support Services
Education
Persuasion
Vision
Decision-making process
Leadership
Teacher Training
Teacher and Manager Selection
Digital Literacy
Empowerment the Teacher
Pension

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A4: "The key word is to create a 'vision', embracing the digital transformation vision is crucial for each shareholder of this process, especially for the sharers in the educational environment. Providing the vision takes time but it is about being able to reveal the awareness by the teacher candidates. The creation of this consciousness in the students going on to education faculties will be an important investment for the future. "

A12: "In this process, uninterrupted cooperation and support should be maintained. Policies that will support professional development with the effective and active in-service training can be formulated towards teachers and managers. Managers and teachers who provide a learning environment that positively affects the development of notable products in the students and the cognitive and affective development of the students can be rewarded. "

A8: "Managers must have technology literacy and have a vision. These elements of digital transformation must be dominant in determining teachers and administrators. "

A11: "The importance should be placed on choosing teachers and administrators. Teacher education should be emphasized. The reputation of the teaching profession must be increased. The teacher and the manager should be trusted. "

In the direction of academicians' opinions and determined themes, academicians mentioned the importance of vision by emphasizing that education policies should be formed in the direction of digital transformation in order to ensure positive change in teachers and administrators. In the development of education policies and vision, academicians who emphasized that teachers and administrators should be included in the decision-making process also emphasized that teachers and administrators should be persuaded for digital transformation. Teachers and administrators talked about the necessity of in-service training on issues such as technology literacy and leadership in the direction of relevant vision and education policies. Responsibility should be given in this direction to be effective leaders who

can manage the process. In addition, academicians, teachers, and administrators who emphasized that they should be supported by attractive salaries and rewards should definitely benefit from support services. It has been seen that academicians who emphasize the empowerment of teachers emphasize the importance of continuous education. These teachers express that they must be digital literate. Teacher candidates who will be trained in the education faculties are also considered as a prerequisite for the transformation to complete the pre-service training in this direction and it is stated that the development of technical knowledge skills will be appropriate. It also emphasizes the necessity of encouraging retirement age pensioners to retire.

Opinions of Academicians on How to Improve and Evaluate the Benefits of Digital Transformation

The themes set out in the view of how academicians will construct a digital transformation culture and how to provide learning in this culture are shown in Table 8.

Table 8. *Opinions of academicians on how to improve and evaluate the benefits of digital transformation*

Themes
Digitalization
Policy
Individual Needs
Student-Centered
Assessment and Evaluation
Curriculum
Comparison

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A12: "Digital transformation will require the addition of students' IT knowledge and skills gains in addition to current acquisitions. This assessment can be achieved by evaluating the activities of the students in the digital environment, the results of the measurement evaluation in these environments, and the products they display based on the information they have obtained from these environments. Peer review can even be done here. "

A15: "Evaluations of specified gains should be assessed by measures such as the central exam and benchmarks like the PISA, where we are in the world, and how we are compared to other countries."

A19: "Digital assessment tools will naturally be used for assessing achievements. In this case, software coding is giving birth to areas like robotics. Because both the product and the process can only be evaluated in this way. "

In view of the views of the academicians and the determined themes, academicians have expressed their opinion that the learners will become individualized. In this context, the academics, who expressed their importance in the policies to be developed, emphasized the necessity of planning what is expected behavior from the students. In addition, academics have expressed, along with the digital transformation, that their digital skills gains can be added in addition to the existing achievements. In order to be able to evaluate the achievements identified, academicians have indicated that there may be product evaluation, peer assessment, portfolios, rubrics, and skill-based evaluation, usually from assessment methods. They also stated that curriculums should be rearranged in this direction and they stated that step-by-step, program-based, sub-learning-centered methods should be included according to the student's

level. Discussing the importance of student-centered education, academics have stated that it is important to compare examples from different countries. An academician;

A6: "I think it might be worth focusing on the achievements that people have developed with their own competencies, as the achievement becomes clearer."

Stated that he/she will be able to determine the achievements of the individuals himself/herself and to learn in line with their own needs.

Opinions of academicians on how to improve Learning Communities in Digital Transformation and how to address individual needs in these communities

The themes set out in the view of how academicians will construct a digital transformation culture and how to provide learning in this culture are shown in Table 9.

Table 9.*Opinions of academicians on how to improve learning communities in digital transformation and how to address individual needs in these communities*

Themes
Individual Needs
Spontaneously
Social networks
Content
Extracurricular Activities
Support Services

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A5: "Anyone can create spontaneous learning communities based on the spread of open lecture resources."

A4: "Learning communities should be designed through social networks that have become part of today's communication. In this way, a platform that is already habituated to use can be transformed into a learning-focused style. "

A8: "Individual support should be given according to the availability of pupils and the situation in the learning environment. It's not just for the virtual environment, but for actually creating a community of students to be brought together."

In line with the views of scholars and the themes set out, academics have emphasized that learning communities should be developed in line with individual needs. They expressed the necessity of bringing together students with different skills in line with common goals. For this reason, it seems that social networks are actively used nowadays, academicians expressing that it is possible to benefit from social networks in education and that it is suitable to use free open source resources for all, expressed that the content to be presented to the students should be rich and open to interaction. They also emphasized that students and teachers must receive support services. They emphasized the importance of bringing together students with extracurricular activities. They also stated that learning communities can occur spontaneously outside the control of the teacher or manager.

Opinions of Academicians on How to Redesign Physical and Virtual Learning Environments Based on Personalized and Collaborative Digital Transformation

The themes set out in the view of how academicians will construct a digital transformation culture and how to provide learning in this culture are shown in Table 10.

Table 10. *Opinions of academicians on how to redesign physical and virtual learning environments based on personalized and collaborative digital transformation*

Themes
Infrastructure
Teacher Competencies
Blended Learning
Individual Needs
Team / Group Work
Physical Environments Decrease
Expert Training

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A11: “I believe that the majority of the responsibility in this regard is the teacher. However, it is important to motivate your teacher in this direction. It is important to educate your teacher about this. For physical conditions, the number of individuals per teacher in learning environments should be reduced. Teachers should spend more time with each individual. "

A4: "It seems difficult to design physical environments with the same effect in this structure. Providing learning experiences in the virtual environment with the same effect value as the physical environment can be achieved by designing mixed learning environments. "

A15: "The learning methods called "Flipped learning" were performed in the virtual environment and the physical lessons came together and the project and teamwork were done together.

A5: "Instruction should be designed in accordance with design models. The current situation and the ideal situation is determined, and the difference is determined as a performance deficit. A comprehensive instructional design process involving analysis, design, development, implementation, and evaluation to close the performance gap should be implemented. "

In view of the academicians' opinions and determined themes, the academicians stated that it is necessary to conduct a situational analysis in order to redesign the physical and virtual learning environments based on personalized and business co-operation. The academicians who emphasized the importance of building infrastructure by completing the deficiencies together with the analysis of the current situation have mentioned the necessity of taking individual needs into consideration and increasing the teacher qualifications. They also pointed out that specialists in learning and instructional technology should be trained. It has been proposed that a blended learning model can be applied by academicians who say that it is appropriate to use physical and virtual learning environments together. In order to increase cooperation, the team stated that group work will be effective. An academician;

A9: "I think that physical learning environments will be further reduced by digital transformation. The infrastructure for virtual learning environments is also a very important point. "

They stated that the physical class can be reduced together with the digital transformation by specifying the view in the form.

Opinions of Academicians on How to Plan Educational Technologies to be Used in a Digital Transformation and How to Ensure Student Safety, Data Security and Learning at the Top Level in These Technological Instruments

The themes set out in the view of how academicians will construct a digital transformation culture and how to provide learning in this culture are shown in Table 11.

Table 11. *Opinions of academicians on how to plan educational technologies to be used in a digital transformation and how to ensure student safety, data security and learning at the top level in these technological instruments*

Themes
Student-Centered
Individual Needs
Infrastructure
Vision
Domestic Production
Teacher Adequacy
Use of Freelance Tools
Support Services
Ethical values
Instant Return
Outcomes
Pilot Application / Project

When the opinions of the academicians are evaluated in general, the above-mentioned themes have been formed. In this respect, some scholars have made the following evaluations:

A15: "The lesson of informatics should be compulsory, the education of data and information ethics should be in value education. We are a community that loves technology but consumes technology. The technological tools in digital transformation should be 100% native. "

A4: "Education technologies can be designed with instant feedback mechanisms and evaluation tools. Data security is another matter because, in addition to preserving data, data monopoly in the digital environment has also become a problem today. Concerned about the theft of data, such as the use of personal data recorded on a platform for commercial purposes by the relevant technology firm, will be the most important protection-type localized technological tools in this point will be widespread.

A8: "It is a situation related to the achievements, and the means should be selected according to these gains. These tools can be software or hardware. Students should be observed. The teacher should be well-equipped because the teacher will provide student safety, data security, and learning."

In view of academicians' opinions and determined themes, academicians stated that student appropriateness and individual needs should be taken into consideration in planning the educational technologies to be used in digital transformation. The academicians who pointed out that their project work and pilot applications should be carried out pointed out the importance of these tools being domestic production. They also stated that there must be support services for the related technologies. In this context, they also stated that the vision is important in determining the educational technologies and it depends on infrastructure studies. The academicians who emphasize teacher competencies stated that teachers should be able to use these educational technologies effectively. Academicians who emphasize that students should be supported by shareholders in terms of student safety and data security and that the student should be directed to the right websites should be informed that information ethics is important and ethical values should be given as courses. An academician;

A6: "Technology means that people who do not have a central social mind in their plans will use a free tool that is not dependent on some technology."

They stated that the planning of educational technologies should be left to the student rather than the central organization or the school, thus expressing that the contents should be rich.

5. Conclusion, Discussion, and Recommendations

5.1.Conclusions

Results of the Opinions of Academicians on How Digital Transformation Will Happen in Education

It can be said that newborns and born in the 1990s and beyond are in such a transformation due to the birth of the digital world, and the information can be accessed by mobile technology anytime and anywhere. In this context, in line with the needs of the individuals, the service, the management, the learning environments and the teaching programs which the educational institutions have presented have also reached the result that they should be transformed together with the digitalization. It can be said that the digital transformation is not only based on the use of technology but also is a vision and a strategy. In this context, it is important for the top decision-makers to develop education policies by applying this vision and to implement these policies from the bottom up, development of infrastructure and infrastructure work as hardware. It will be the right step ensuring that our education system's shareholders participate in the decision-making process in the development of policies and in the creation of the vision. Along with the policies to be determined in this context, it is necessary to define in advance what is expected from future generations and from the school and how to train the individuals. In order to prepare the society for the digital transformation process that will take place in the schools, it is absolutely necessary for the parents to withdraw to the schools and to carry out the necessary informing work. In addition, shareholders that will support the provision of equipment will make it easier for companies to provide continuous support services, as well as support for municipalities if supported by municipalities. The fact that other public institutions and organizations are exemplary for digital transformation culture and support institutions providing education service will serve to change the culture as well as provide positive change for students, teachers, and administrators. It is absolutely necessary for administrators, teachers, and students to complete the necessary pre-service, in-service training completely in preparation for the digital transformation. In addition, the training of candidates as individuals with this vision during university education is of great importance as the new generation of teachers can make the transition easier. It has also been achieved that the selection of managers and the identification of students taken into education faculties and the need to pay attention to the presence of individuals with this vision in teacher appointments have been achieved.

Apart from human resources, shareholder support, and equipment, it is also the outcome that digital and school concepts cannot be physically together with digital transformation. In this respect, it is necessary that the contents of the distance education services to be provided for the individuals to be able to access to the learning services within the offered education services are always rich and sufficient. In this context, the gains to be made in the content to be presented must be student-centered and personalized, and the workload on the teachers will be even greater. By working more than ever, students are more likely to recognize and to apply appropriate method techniques in a digital context.

Digital transformation is not an instant process. In this context, long-term planning is required and it is appropriate to have continuous evaluation and feedback system. It can be said that it would be right to report cases that are going well or failing. Providing data and student safety in the digital tools to be used is of great importance nowadays. For this, it would be appropriate for the students to be directed to the correct websites by the teachers and to provide support from the technology companies. It can be said that the importance of the domestic production of the digital tools to be used in the digital transformation is an important condition for the transformation of the collecting period which is produced from the consuming society. Similar results were found by Sandkuhl and Lehmann (2017), they note that analysis of all the

layers of the enterprise architecture, including the objectives and steps of the transformation activities and the visualization of the effects of these digital transformation steps on all layers. Parvianinen, Tihinen, Kaariainen, and Teppolar, (2017) describe the starting point of a systematic approach to address the digital transformation that will help companies analyze the impact of the digital environment and the steps needed for their own environment. The method defines four major iterative steps: first, the company needs to define the location associated with the digitization and the goals that the company wants to accomplish. Then, the work required to achieve these goals should be defined by defining the gap between the objectives and the present situation. This needs to be turned into a systematic planning of a roadmap and implementation using conceptual evidence as required by the roadmap.

Results of the Opinions of Academicians on How Digital Transformation Will Happen in the Context of Education Management

In order for digital transformation to take place in the context of educational management, executives in top management must have a vision of digital transformation. It would also be appropriate to lead individuals who think of the future of the country, follow the practices in other countries, know the expectations of the community, and are caught up in order to develop this vision. In order for education to be able to enter the digital transformation process, it must first be supported by strategic plans so that education policies can be defined in this direction and can be experienced in the entire education system from top to bottom. It is of utmost importance that shareholders participate in the decision-making process of education policies and strategic plans, and that their ideas are taken. It can be said that the inclusion of shareholders in this process will facilitate the management processes. Since the digital transformation will be done by people, it is important to ensure active participation of the individuals who make up the workforce in the field. It is important for schools, which are a sub-system for this, to persuade managers and teachers to have this vision, to take the necessary training and to benefit from continuous support services. In this context, it is important to carry these cultures to schools in the context of digital transformation by working primarily in education faculties. The ability to achieve digital transformation in schools is based on competence both in terms of human resources and infrastructure. It is an important point for leaders to be assigned to schools to act with this vision and to lead. It has also been achieved that teachers must be rewarded for teachers' empowerment and empowerment to design learning environments in line with the needs of their students, and salary and wages must be improved. Similar results were found by Kutzschenbach and Bronn (2017), enrich the strategic choices of decision-makers about the opportunities and practices of a feedback system approach, digital technology-driven transformations, and potentially long-term outcomes.

Results of the Opinions of Academicians on How Digital Transformation Will Happen in Curriculum and Instruction

It can be said that the digital transformation can be realized through educational programs and teaching contexts by the application of student-centered, personalized learning. In digital transformation, student-centered education should be more prevalent, students should be recognized in every direction, and the student should be able to be optimized in this context. In addition to this personalization, in order to support skills such as collaborative learning, creativity, production which is one of the main elements of digital transformation, it is necessary for the student to be supported by the teachers in the physical learning environments or virtual learning environments. It is more appropriate for teachers to organize activities at the application, analysis, synthesis stage for the students who can reach and where they want to wise, and also redesign the classes and even the digital transformation of the school accordingly.

If the changes to be made in the curricula are made in accordance with the digital transformation, the gains should be developed in this direction. It will be correct to plan the behavior expected from individuals in advance. Furthermore, contemporary assessment and evaluation methods, such as a rubric, portfolio, product evaluation, peer evaluation, are more suitable for evaluating achievements in digital transformation.

Distance education applications need to be used in digital transformation and face education should be blended with information and communication technologies. In this context, students need to be trained in terms of digital skills. It is also important that these digital tools to be used in digital transformation are native. We can say that the digital tools to be used for learning can be provided through the central organization or can be completely left to the individual. In order to ensure student and data security, it can be said that it is appropriate to take the opinions of related shareholders and create courses such as solutions and information ethics in the curriculum. In the digital transformation, the ethical values must be given to the students since the student can also provide his / her own safety.

The teacher is an important point in the process of digital transformation in the production of appropriate content for the student and it is absolutely necessary to be supported in this direction. It can be said that the development of digital literacy skills in this context would be appropriate for teachers. Teachers are required to complete in-service training and it is also possible to obtain support from universities. TEDMEM (2013), notes that providing teachers with the necessary training for technology use is as important as providing class technology, and it is not only a one-off training for teachers but also a combination of computer skills and their skills in the classroom environment for teaching and learning they should be given continuous training on how to use them.

5.2.Recommendations

In this part, in the light of findings and results, the following recommendations have been developed for policymakers, administrators, and other researchers. According to Andreasen and Christiansen (2017), the transformations that will take place in the practices of the school in everyday life of teachers are key for research on understanding professional teaching practices and developing teacher competencies. More information is needed about which processes teachers can easily convert and which parts are more difficult and why this is so.

- Digital transformation in education is inevitable, so future education policies need to be done in this direction.
- Strategic plans for the implementation of educational policies on technology should be developed.
- A digital transformation vision must be established and managed by leaders with this vision.
- There should be given feedback and made an evaluation about how digital transformation process works.
- Managers, teachers, and students should get training in the direction of digital transformation vision and in-service training activities.
- Parents should also be taken to schools and necessary informing activities should be taught to them.
- In-service training for digital transformation should be given to teachers and school administrators by experts and academicians.
- Support services should be provided at schools for managers, teachers, and students.
- Empowering the teachers should be done, in this direction rewarding, salaries and wages should be improved.

- Digital natives should be supported for digital transformation in education and a digital transformation culture should be created in education faculties.
- The physical conditions and services offered by schools should be re-audited.
- Training programs should be updated to include digital acquisitions.
- It should be encouraged to actively use the information and communication technologies to provide participation in the classroom environment.
- It may be appropriate to include distance education in technology practices within the formal education system.
- The content of distance education should be rich and can be personalized.
- In the digital transformation process, it should be given importance research-development and project development.
- Instead of traditional assessment and evaluation methods, individual-oriented contemporary assessment and evaluation methods should be used.
- Support should be taken from different state institutions and organizations, non-governmental organizations and universities.
- Research can be done on which digital elements for digital transformation.
- Researchers can conduct studies to develop curriculum topics online.
- Pilot studies that suitable for the digital transformation, technology integration studies can be carried out.
- Digital transformation can work on what will be the gains to be added to existing training programs.
- Separate qualitative or qualitative data may be collected for each question received from the academicians.

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