

Determining the Digital Transformation in Education in the Society 5.0 Process

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Abstract—In this study, it was tried to determine the digital transformation in education in the Society 5.0 process. The research was carried out in the fall semester of 2021–2022. It was realised with the participation of 120 university students. The case study pattern, which is one of the qualitative research approaches, was adopted to determine the views on Society 5.0 tools. The case study is an exploratory research method. In the research, 4-week digital transformation training was given to university students. A ‘Society 5.0 and digital transformation’ questionnaire prepared by the researchers was used to collect data in the study. The questionnaire used in the research was distributed to and collected online from university students. The findings obtained from the data are explained in detail with the content analysis method. As a result of the research, it was concluded that the digital transformations of university students were determined within the Society 5.0 process and these values were positive.

Keywords—society 5.0, distance education, digital transformation, university students

1 Introduction

Many electronic devices or processes are described as digital [7]. Contrary to popular belief, the concept of digital does not mean electronic devices, but is defined as the electronic processing and presentation of data. When considered with this definition, the concept of digital can be defined as the process of making sense of two component data series by combining ones and zeros, and this continues in an endless cycle [1].

Technological developments, which greatly affect daily life, bring about global changes and cause radical changes in many areas [12] [15]. Throughout the history of humanity, technological developments have directly affected production and consumption habits. In societies that transform to adapt to change, areas such as cultural structure, social structure and working environment are significantly affected [2],

i.e., Web 2.0, broadband Internet, mobile technologies, cloud computing, digital media, big data, artificial intelligence, augmented reality, Internet of Things, 3D printers etc. Managing production lines with digital systems instead of analogue systems has opened the doors of the industry 3.0 era. During this period, when automation came to the fore in manufacturing, it was seen that computers were used for digital control [4]. The effect of technology on society has been the harbinger of a new process [3]. When the development of an industry is evaluated in a historical process, it can be seen in four different stages. The concept of Industry 4.0 was first used at the Hannover Fair in Germany in 2011 to represent the fourth of these milestones [6] [5].

The definition of Industry 4.0, which is accepted as the process we are in, can be defined as machines intertwined with sensors [8]. If we take it from a more detailed perspective, it can be defined as the management of physical systems with the help of technologies, such as the Internet of Things (IOT), artificial intelligence, augmented and virtual reality, robotic systems, smart factories and cloud technologies [9].

Digitisation is the most advanced. One of the elements in the communication industry is to protect learning for students [21] [10]. The digitalisation of the era that is currently developing rapidly, dramatically affects human life performance [10].

1.1 The industrial revolution

Machine algorithms and computer software, a technological revolution, developed rapidly towards the end of the 20th century, taking place in different ways in every area of our age [11]. Artificial intelligence technologies are increasingly important these days. Alan Turing determined the concept of machine intelligence for the first time. In other words, they emerged as “thinking machines”. The Turing test was carried out in 1950. A big step has been taken by providing the measurement of machine-like or human-like mind behavioural skills [13].

1.2 Industry revolution 1.0

It is a structure containing static HTML pages created in 1995 for easy access to the importance of internet research. In this structure, users do not interact, but occupy a passive position on the web [14]. Internet users were not authorised to add or comment on any content. Network users used Web 1.0 tools for information only. Web 1.0 tools are a network that focuses solely on learning information. However, with the advancement of technology day-by-day, this web network has been replaced by Web 2.0 technologies [13] [16].

1.3 Industry revolution 2.0

Social media revolution, high interaction, user participation in content creation and a dynamic and two-way connection platform to shared resources have been created. During this period, there was the emergence of very popular websites, such as Wiki, YouTube, Facebook, Twitter, blogs and Instagram. Websites are interactive and the features of providing feedback between users are provided by Web 2.0 tools [17] [30].

1.4 Industry revolution 3.0

The main purpose of Web 3.0 is to define the data structure, and to be more efficient, this data supports the creation of user profiles that allow them to connect. In our age of using Web 3.0 tools, many institutions want to have them [18]. While producing big data, significant steps were taken to increase customer satisfaction and expectations, taking advantage of the opportunities offered by the use of this technology in corporate decision-making with the data in the data warehouses created according to the Internet user's search for technology. When artificial intelligence and fuzzy logic came together, it was passed with Web 3.0 in data analysis [17] [13].

1.5 Industry revolution 4.0

With the development of artificial intelligence, called Industry 4.0, changes in societies accelerated. This change directly affects industrial applications, production and service sectors. In our age, web tools affect all our lives. Industry 4.0 has affected the world globally in every field. Education systems are the most affected areas [14] [19].

1.6 Society 5.0

'Society 5.0' was launched in Japan in 2016 with the slogan 'super smart society' announced to the whole world. Society 5.0 technology where all devices must be connected to the Internet is called emotional or telepathic network [20]. With this technology, advanced artificial intelligent robots, avatars and 3D virtual environments are expected to be used in daily life. In addition, with Web 5.0, hologram systems can be used for daily meetings via headphones for users. Users will be able to interact with the web content and the data will be created in accordance with the user's face. Digital technologies, such as the Internet of Things, artificial intelligence and robotic coding, science, big data and data mining, imagination and creative thinking. innovation, which is expressed as space and innovation, algorithms, robotics, mathematics, statistics, artificial intelligence machine learning, deep learning and artificial neural networks, form the basis of digital transformation [22] [29]. In this direction, universities, coordinating the Ministry of Digital Transformation, technopolises, technology transfer offices, ARGE project funds, research infrastructure and outside the university research and design organizations, vocational high schools and science high schools throughout the country should be part of the ecosystem of 'science and technology research'.

Purpose of the research. In the process of Society 5.0, the aim of determining the digital transformation of university students in education was studied. In the digital environments provided to university students, their opinions are very important after the Society 5.0 training. In this general-purpose grab, answers to the following sub-objectives were sought:

1. What is the importance of digitalization in education?
2. What do Industry 4.0 and Society 5.0 mean to you?
3. What is the Community 5.0 advantage?

2 Method

This training has not been conducted as a case study, which is one of the information prepared for the education of societies from universities. The case study is an exploratory research method. In real life, it is used to create a real universe [23]. For this purpose, to test a theory or concept, an uninvestigated single-case design was applied from people who were not informed about an identical situation or unexplored [23].

2.1 Research group

It was carried out with the participation of 120 university students in the fall semester of 2021–2022 in order to determine the opinions of university students on Society 5.0 tools. Digital transformation training was given to teacher candidates within 4 weeks. Opinions on Community 5.0 tools were received.

2.2 Data collection

In this study, a semi-structured interview questionnaire was prepared and used to collect data. The questionnaire was prepared by the researchers and each question was checked by three experts in their field. As a result of the opinions received from the experts, the questions were finalised. The findings obtained from the research were confirmed by the students. The accuracy of the data obtained in this way has been determined. The research questionnaires were collected from students in a digital environment.

2.3 Analysis of data

The content analysis method was used in the analysis part of the data obtained from the students studying at the university. In this research, the raw data obtained from the interviews were primarily coded in the content analysis. Then, the coded data was explained and interpreted as themes.

2.4 Study group of the research

In order to achieve the objectives of the research, 120 students studying at the university were selected. While choosing the study group of the research, maximum diversity sampling, one of the purposive sampling types, was chosen for sample selection. The purpose of choosing this method is to ensure that the diversity of individuals is reflected at the highest level with a small sample group that may be a party to the problem [24]. The study group of the research consists of 120 university students studying at the university chosen on a voluntary basis.

Personal information of the participants in the research is given in Table 1.

Table 1. Demographic information

Variable	Group	F
Gender	Female	61
	Male	59
University	U1	47
	U2	45
	U3	28

3 Findings

3.1 Importance of digitalisation in education

Table 2. Importance of digitalisation in education

Theme	F
Making things easier	59
Diversity in learning	45
Adaptation to the times	11

Students studying at the university were asked about the place of digitalization in education, as a result of their 4-week education process. There were 59 university students who said that digitalization makes things easier in education processes. There were 45 university students who said that digitalization provides diversity in learning. There were 11 university students who stated the place of digitalization in education, as in every field, as the return of the age.

Opinions of some of the university students are as follows:

‘We live in a digitalising and evolving age. Digitisation, which spreads in every field as a result of the age, is indispensable in the field of education. Digitisation makes things easier in the field of education, as it does in every field’.

‘If the methods and techniques used in the education process are varied, the learning will be permanent. We are in the age of technology. The use of digital products in education provides diversity in learning. In this way, learning becomes permanent and fun and enjoyable environments are provided while learning’.

3.2 What do industry 4.0 and society 5.0 mean to you?

Table 3. Industry 4.0 and Society 5.0

Theme	F
Industry 4.0	120
Innovation opportunity	51
Providing an enabling environment	38
Computer-aided training	26
Society 5.0	120
Human-centred society	70
Super smart environment	30
Ensuring productivity	20

After the training offered to university students, they were asked what Industry 4.0 and Society 5.0 are. The answers given by the students for Industry 4.0 are that it offers an opportunity for innovation, a facilitating environment and computer-assisted training. For Society 5.0, there were 70 students who responded with human-centred society. There were 30 students who stated that it provides a super smart environment and 20 students said that it provides productivity.

Opinions of some of the university students are as follows:

‘Industry 4.0 tools are one of the effective methods used in education. Society 5.0 regulates human life, industry 4.0 is mechanisation. Society 5.0 tools have been developed by incorporating mechanisation into human emotions’.

‘We can define Society 5.0 tools as a Super Smart Society. The concepts of digital transformation and artificial intelligence have entered all areas of our lives. Society 5.0 is the most effective tool that enables us, people, to communicate with machines and robots, that is, with industry 4.0 tools’.

3.3 The advantage of society 5.0 in education

Table 4. The advantage of society 5.0 in education

Theme	F
Learning anywhere	62
Student-centred	38
Teacher oriented	12
Cooperative learning	10

University students were asked about the advantages of Society 5.0 in the educational process. They stated that the biggest advantage that the Community 5.0 tools offer is the opportunity to learn everywhere (62). There were 38 students who stated that it is a student-centred approach in which students are active. There were 12 students who stated that they are teacher-oriented rather than learner-centred. There were 10 students who stated that they offer a cooperative learning environment.

Opinions of some of the university students are as follows:

‘Society 5.0 tools are the best advantage of providing the opportunity to learn anywhere, anytime, anywhere with technological tools, apart from face-to-face education, traditional education, but only in the classroom environment’.

‘In traditional learning methods, the teacher lectures and the student listens. In other words, the teacher is active, the student is passive. In the trainings given with the Society 5.0 tools, our teacher guides learning, we, that is, the students learn. There is a saying in this, if a person does a job himself, he learns better. If we start with this saying, learning becomes permanent because students are active thanks to these tools’.

‘It provides a collaborative learning environment. In other words, student-student interaction provides student-teacher interaction. In this way, we learn together’.

4 Conclusion, discussion and suggestions

In this study, it was tried to determine the digital transformation of university students in education in the Society 5.0 process. In this study, which was carried out with the participation of 120 university students, a 4-week Society 5.0 and digitalisation training was given. The opinions of the students are quite positive.

Students studying at the university were asked about the place of digitalisation in education as a result of the 4-week education process. In the results of the findings of the students regarding the place of digitalisation in the education process, it was concluded that they made the work easier, provided diversity in learning and expressed it as the turn of the age, i.e., the process of adaptation to the age. We are in an ever-evolving age. The level of technological developments in the future cannot be predicted at the moment. The concept of digitalisation shows its effect in all areas of life. One of these areas is the field of education. It is an inevitable fact that digitalisation used in the field of education will enable future generations to learn.

After the training given to university students, they were asked what Industry 4.0 and Society 5.0 are. When looking at the results of this finding, it is said that Industry 4.0 offers an opportunity for innovation, is a facilitating environment and provides computer-assisted training. For Society 5.0, there were 70 students who responded with people-centred society. There were 30 students who stated that it provides an opportunity to provide a super smart environment and 20 students who said that it provides efficiency. Industry 4.0 and Society 5.0 are intertwined concepts. Robots are Society 5.0 tools that humanise artificial intelligence concepts’ Industry 4.0 tools. With the developing technology, the classroom environments we are accustomed to are gradually giving way to new learning environments. Education, which was previously limited to chalk and blackboard, has been replaced by whiteboards and smart boards over time [26]. Education researchers agree that the main purpose of the different technologies used should be to facilitate teaching and increase learning [27].

University students were asked about the advantages of Society 5.0 in the educational process. It was stated that the biggest advantage that the Community 5.0 tools

offer is the opportunity to learn everywhere. Distance education offers diversity in co-educational learning. Expecting students to learn with a single learning method cannot be expected in today's age. Online education, distance education, learning from home, giving homework at home, enabling students to access lecture notes wherever and whenever they want provide permanence in learning. There were 38 students who stated that it is a student-centred approach in which the student is active. There were 12 students who said that they are teacher-centred rather than student-centred. There were 10 students who stated that it offers a cooperative learning environment. Gleason and Von Gillern [28] stated that the cooperative learning approach provides alternative learning, unlike the traditional approach. With cooperation, students can share information. Karoğlu, Çetinkaya and Çimşir [25], in their study, stated the social awareness of the 'use of technology in education' emphasised with Education 3.0 and 'the understanding of education anytime, anywhere', which is one of the main issues that will be transformed in education in the context of Education 4.0. They stated that it is an element that should always be included in education.

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