

Teacher Education in the Digital Transformation Process in North Cyprus: A Situation Analysis Study

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Abstract

While the world was already moving towards a digital future before 2020, the coronavirus pandemic accelerated that significantly in many sectors. This is certainly true with regard to digital transformation in the classroom, which gathered pace almost overnight when schools shutdown and lessons first moved online. At the time, the shift served to highlight how unprepared most of the sector was for digital transformation. At this point, both teacher and student skills and competencies for digital transformation have been questioned and many academic studies for literature have been put forward in this context. In this research, teacher education and competencies are questioned in the transition to the digital transformation process in Northern Cyprus. In addition, tools for measuring digital competencies and teacher-oriented changes will be introduced. It is thought that determining the competencies of teachers and the tools measuring these competencies within the scope of the digitalization process will be effective in ensuring quality in education on behalf of Northern Cyprus in the future and will shed light on future research. In the literature review, although the existence of studies belonging to Northern Cyprus in measuring the digital competence of teachers/teacher candidates' is remarkable, it has been determined that there are not enough numbers according to the importance of the subject. Considering the rapid transition and adaptation to the digital transformation process, especially during the pandemic period, since teachers are the most important part of digital education, it is foreseen that more qualitative or quantitative research is needed to interpret and measure digital competencies.

Keywords: digital transformation process, teacher-teacher candidates' education, digital competencies, measurement example of North Cyprus (TRNC)

1. Introduction

Technological developments, which greatly affect daily life, bring about global changes and cause radical changes in many areas, including Web 2.0, broadband Internet, mobile technologies, cloud computing, digital media, big data, artificial intelligence, augmented reality, Internet of things, 3D printers etc. The effect of technologies on society has been the harbinger of a new process (TUBITAK Bilgem, 2019). The digital transformation brought about by these developments continues to advance day by day. It is remarkable that many sectors act in order to understand, make sense of and implement this transformation. Considering the opportunities provided by the changing and developing information and communication technologies and the changing social needs, the holistic transformation that takes place in order to provide more effective and efficient solutions to basic needs in areas such as public administration, industry, education and health is called digital transformation (Karabacak & Sezgin, 2019).

The rapid change and development seen in technological devices today also change the needs of individuals. In other words, the development and change in technology affect the teaching process by changing the method of accessing information and the speed of accessing information. Technological tools used in the field of education are increasingly diversifying. In recent years, digital content such as video projectors, smart boards, mobile devices, e-books, downloadable music, uninterrupted audio and video networks and online social networks are technological developments that affect the lives of the majority.

The use of technology for teaching purposes has become inevitable in order to respond to the teaching needs of the changing generation and to improve their teaching environment. From this perspective, digital transformation is a

necessity rather than a pleasure. In addition, it is seen that it should be applied in fields that will add quality to our lives such as education, health, public administration and industry. Considering the Digital Competitiveness Report (International Management Development Institute, 2017), which states that the general performances of national economies are measured with three main components defined as ‘knowledge’, ‘technology’ and ‘readiness for the future’, the issue of digital transformation in education gains even more importance. Nowadays, when digital transformation is gaining momentum and even the change that comes with the pandemic period is being taken into account, it is questioned how schools will be in the future and whether education will be held in physical environments (Karoglu, Cetinkaya, & Cimsir, 2020).

One of the important points to be questioned is the design of the future of education by consciously managing this process, without accepting any random change in the education process. In the digital transformation process, teachers play a great role in the conscious management of the process. The two important questions that come to mind at this point are as follows:

- “What is the stage of teacher education and teacher competencies in the digital transformation process?”
- “What are the trends and teacher-oriented changes in digital competencies measurement tools?”

At this point, in this research, teacher education and competencies are questioned in the transition to the Digital Transformation Process in Northern Cyprus. In addition, tools for measuring digital competencies and teacher-oriented changes will be introduced.

It is thought that determining the competencies of teachers and the tools measuring these competencies within the scope of the digitalization process will be effective in ensuring quality in education on behalf of Northern Cyprus in the future and will shed light on future research.

2. Theoretical Framework

2.1 Use of Information and Communication Technologies and Teacher Competencies in Education

Technology, which is one of the biggest factors leading the change and development of today’s world, has brought new definitions and concepts with it. When the literature is examined today, new technology concepts such as Information Technology, Information Communication and Information and Communication Technologies exist in all areas of our lives and seem determined to maintain this existence as long as changes and developments continue. Although there are many definitions of the concept of information and communication technologies in the literature, the prominent one is that information and communication technologies are all kinds of visual, audio, printed and written tools that provide access to information and creation of information.

As in many other sectors, the education sector has become an institutional structure where communication technologies are used in all its dimensions or where it is most demanded. Especially with the use of information and communication technologies, the increase in quality expectations in education, the effect of these technologies on the learning–teaching processes and the changing paradigms in education in parallel with this bring the professional and academic competencies of teachers about the use of these technologies (Barnett, 2010). With the reflection of the rapid change in technology in the field of education, the expectations of the society have also changed, and in order to meet these expectations, changes are expected from the teachers who are the pioneers of change (Ayaz, Oral, & Soylemez, 2015). In various studies, it has been stated that teachers who can set an example are needed first in order to create an Information and Communication Technologies (ICT) literate society. However, it has been stated that there is a relationship between the competencies of teachers, which is one of the determinants of the quality and efficiency of education, and the quality of education (Gao et al., 2011).

Many national and international organisations have developed standards regarding these competencies expected from teachers. In this context, the ISTE has put forward standards consisting of 5 categories and 20 performance indicators in its updated version in 2008 (ISTE Report, 2008). These categories are as follows:

- Facilitate student learning and encourage creativity;
- Learning experiences of the digital age and design and develop assessments;
- Studying and learning in the digital age be a model;
- Being a model for digital citizenship and to encourage individuals about citizenship;
- Engaging in professional development and leadership.

Some of the 20 performance indicators under these categories were “being technology literate, using technology in their lessons, orienting students to use technology” (ISTE, 2012).

Within the scope of the ICT Competencies and Standards for Teachers prepared by the UNESCO, it is

recommended to develop technology literacy skills of teacher candidates (UNESCO Report, 2008). In this study, the competencies expected from teachers were divided into three categories and each category was examined under six main headings. These categories are (1) technology literate, (2) deepening knowledge, and (3) creating knowledge. A total of 62 performance indicators were included under the following six headings for each of the categories; some of them are (a) policy, (b) curriculum and evaluation, (c) pedagogy, (d) ICT, (e) organisation and management and (f) teacher professional development.

In this context, when both ISTE and UNESCO reports are examined, learning experiences of the digital age in teacher competencies and assessments, being technology literate and integrating ICT tools into their lessons are revealed. However, according to the Teacher Competencies Report of the Turkish Education Association (2009), in the last 20–25 years, in teacher training and defining their competencies, there is a transformation from the behaviourist understanding of the 1960s to the understanding of “technological pedagogical content knowledge” in which content knowledge, pedagogy and technology are integrated. The same report explained that the transformation in the field of education is aimed at techno-pedagogical knowledge; it was stated that teachers should have knowledge about pedagogy and content knowledge by integrating it with technology (Turkish Education Association Report, 2009).

According to the reports, the requirements in teacher competencies are listed as follows:

- Teachers should use ICT tools appropriately at every stage of the learning–teaching processes from planning to practice;
- They should develop the necessary materials for this purpose and create appropriate environments;
- They should be a model for learners’ use of technology and use technology for their own professional development.

2.2 Digitalization in Education with ICT Integration

In today’s world, where people live together with technology, digitalization is also increasingly taking its place as an indispensable concept in our lives. However, rapid developments and changes in technology have led to a compulsory digitalization process in all sectors. Societies, individuals, institutions and organisations do their best to adapt to this process. Today, especially with the concept of Industry 4.0, all applications in the manufacturing and industry sectors have met the technological world. In this context, brand new institutions such as smart factories, machine learning, internet of things, cloud computing, artificial intelligence technologies and human–machine interaction have been put forward.

There are many conceptual definitions of digitalization in the literature; in the most general definition: it is the name given to the process of transferring accessible and available resources to digital media to be read by a computer (Ahmad & Murray, 2019; Kohli & Melville, 2019; Leviakangas, 2016). The steps to be taken by societies on the path of digital transformation bring about many advantages such as:

- Efficiency,
- Security,
- Speed,
- Easy access to information,
- Modernisation,
- Collaborative work,
- Cost and energy savings,
- Increased innovation

Digitalization has spread too many areas within societies. The most important of these areas is education. The imperatives of digital transformation in the field of education are listed as follows:

- Global competition,
- Innovation and quality in education,
- Innovation and quality in research,
- Meeting the needs with Industry 4.0,
- Efficient use of educational resources.

In summary, the concept of time and space has been eliminated with digitalization. Online learning with digital

education platforms has gained importance instead of face-to-face education. In this context, technology has been transformed into a much broader and more flexible learning tool and has become a link between all stakeholders (teachers, students, instructors, mentors and parents) of education (Gunduz & Atas, 2020).

Apart from all these, digitalization has gained new dimensions with the pandemic period we are in. Due to the COVID-19 pandemic, citizens in all countries of the world have closed their homes and alternative ways have been sought in both the sector and the institutions. The most important of these sectors is undoubtedly education. Especially, today's world has made it necessary to define young people born after 2000 as the Z generation and to benefit from e-learning ICT tools and environments in classroom education. In this sense, this digitalization process increases the motivation of the students and alleviates the responsibility of the teacher. Right at this point, it is important for teachers to have technological competencies that can evaluate the digital learning properties of the relevant generation Z.

2.3 Professional Development Programmes and Teaching Education in Digital Transformation

While preparing professional development programmes, the main purpose is to change teacher behaviours and attitudes in the desired direction in line with new technology and information. In this context, while the first step in professional development is to develop positive attitudes, the next step should be to determine the technological competencies of teachers and to develop the programme in this direction (Barnett, 2010).

While the world was already moving towards a digital future before 2020, the coronavirus pandemic accelerated it significantly in many sectors. This is certainly true with regard to the digital transformation in the classroom, which gathered pace almost overnight when schools shutdown and lessons first moved online (Business Innovation Report, 2021). At that time, the shift served to highlight how unprepared most of the sector was for digital transformation. At this point, both teacher and student skills and competencies for digital transformation have been questioned and many academic studies for literature have been put forward in this context. The examples of these studies are explained in the following paragraphs.

Balyer and Oz (2018), in their study, examined the views of academicians on digital transformation in education. 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 programme and management processes. The study group consists of 20 faculty members working at 9 different universities in the Department of Educational Sciences. As a result, it revealed that in the digital transformation process, academics should first create a vision for an effective learning environment and manage the learning and teaching processes accordingly. 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 was recommended that educational administrators and programme specialists should be ready for this transformation and have the qualities to manage this transformation.

Chorosova et al. (2020), in their study, examined the digital transformation towards education. In this report published, the need to measure teachers' professional deficiencies, the current saturation of school education in terms of digitalization and the transition to online learning were analysed. Also, digital competencies were tested in the digital transformation process within the scope of teacher general education. In this context, 'cognitive models and algorithms' have been proposed for the formation of teacher perception. In addition, the UNESCO recommendations on the structure of Teachers' ICT competence are listed in the study. These are 1) study with data: information and data management; 2) communication and cooperation: communication and cooperation in a digital multicultural environment; 3) creation of digital content: creative thinking; 4) security and problem-solving; 5) information and digital literacy: critical thinking in a technical environment and 6) Questions on 11 digital competencies.

2.4 Teacher Education and Competencies in North Cyprus

When the educational policies of the Cyprus Turkish Secondary Education Teachers' Union are examined; 'Education is the most talked about, long-term investment in every country. The most important competencies sought is "What kind of individual and society do we want?" The answer to the question is reserved. For this reason, education systems should be revealed with facts in this direction'.

The basic standards in education developed by the union on behalf of Northern Cyprus are:

1) Scientific, Efficient and Quality Education:

With an understanding that attaches importance to scientific thinking and science, efficiency and quality should not be compromised in every field and level of education.

2) Collaborative, Participatory and Democratic Education:

Cooperation, participation and democratic understanding in the field of education and training should be carried out at the classroom, intra-school, inter-school, inter-communal and international levels. In addition, all kinds of active and feedback participation of the student–teacher–parent context and civil society organisations should be ensured. In addition to the student–teacher–parent context, all kinds of active and feedback participation of non-governmental organisations should be ensured.

3) Libertarian, Creative and Tolerant Education:

It should be ensured that creative individuals are raised with a tolerant understanding and understandings that allow questioning in every field and at every level of education.

4) Education Emphasising Computational Development and Foreign Language:

An understanding that fulfils the requirements of the information era and makes all kinds of communication effective should be structured.

5) Dynamic, Renewable and Lifelong Education:

A structure that will enable individuals in all classes of society to access information they need should be implemented.

6) Safe, Mental and Physical Health Prioritising Education:

At all stages of the education process, the requirements of getting education in a safe environment should be fulfilled immediately, by prioritising the mental and physical health of the student.

7) Education Foreseeing European Union Standards:

The country, which aims to integrate with the European Union, should include the structure that envisages obtaining the necessary information in this field and benefiting from the knowledge of Europe.

According to the teaching profession defined by the TRNC Ministry of National Education and Culture:

- Teaching is a special profession that carries out the educational and training activities of the state and undertakes the management duties of education and training institutions.
- Teaching profession is gained through general culture, special field education and pedagogical formation. In order to gain these competencies, it is essential for teachers to have higher education, regardless of their teaching level.
- Teachers are obliged to carry out their professional duties in accordance with the general objectives and basic principles of the Turkish Cypriot National Education.
- Those who will practice the teaching profession in the TRNC must know the special and general competencies stipulated in the Teachers' Law. It is a condition that those who have these competencies and will become teachers have to register with the Ministry.

Considering the 1990s and today, the existence of an institution in teacher education in Northern Cyprus draws attention, such as the Ataturk Teacher Academy. In 2000, the institution was transformed into Ataturk Teachers Academy with the new law. Ataturk Teachers Academy continues its educational activities with a competent academic staff, employees and elite students in the TRNC. The institution affiliated to the TR Ministry of National Education and Culture trains primary school teachers and preschool teachers with a 4-year programme. In addition, the secondary education field teaching non-thesis master programme for university graduates is continued.

Ataturk Teachers Academy, with all its faculty members and students, aims to raise the future generations of TRNC as citizens who are modern, democratic, loyal to their own culture and who are interested in and love science, art and sports. Ataturk Teachers Academy always preserves its cultural and historical importance as the oldest teacher training institution of Turkish Cypriots in higher education. Ataturk Teachers Academy is a member of the International Universities Search and Rescue Council.

In their study, Tacman and Comunoglu (2015) investigated how the prospective classroom teachers were evaluated, what they expected from the candidates and the effectiveness of the teacher education programme conducted at Ataturk Teachers Academy (ATA) in meeting expectations. The study was carried out by phenomenology, a qualitative method. In order to analyse the data, we obtained information from the views of 15 teachers of ATA and 15 teachers who graduated from Ataturk Teacher Academy. The research findings were studied and interpreted in the framework of four main topics which are as follows: knowledge, basic professional

attitudes, effective communication and teaching abilities.

Gurtekin and Baskan (2013), in their paper, studied the teacher training process in the History of Turkish and Cyprus Turkish Education and the topic regarding the teacher training policies developed in accordance with the requirements of the period and the teacher training in the national education councils, and the development plans within this period have been scrutinised and the details are hereby presented. At the end of the study, as a suggestion for teacher education in Cyprus, paying attention to effective cooperation with the Ministry of National Education in order to increase the quality of teacher training in education faculties and teacher schools where applied education is given; in addition, it has been suggested that a more comprehensive teacher training and in-service training system should be followed in the Turkish Cypriot Education System, especially in the national education institutions; and in this context, the teaching competencies of secondary education teachers should be increased. In addition to all these, it was emphasised that emergency in-service training should be given for teachers to gain technology proficiency at the point of adaptation to the developing era.

Subjects such as teacher training, employment and professional development, educational environment, institutional culture and school leadership and empowerment are on the agenda under the title of “2023 Vision in Education in Cyprus” for competencies the coming years via Cyprus Turkish National Education Council.

2.5 Digital Transformation in Education in North Cyprus

Digitalization efforts, which have been implemented as a necessity in recent years, especially in developed countries, have changed the identity of education. Today, it is observed that digital elements are used much more in a wide range from preschool education to higher education. Digital education, which strives to provide fast, effective and qualified results, has now become a natural part of education processes, even though it creates debates about its costs (Taskiran, 2017).

The increasing level of interaction of people with digital elements in recent years makes it mandatory for them to use digital elements at every moment of their lives. The fact that students and teachers, who are the two main elements of education, become digital individuals or individuals, who follow technological developments very closely, has a great and positive effect on the digitalization of education (Oksuz, Demir & Ici, 2016).

It is possible to explain the importance of the process of digitalization and technology integration in education with the following elements (Clement, 2017; Ireland Ministry of Education, 2015; Kaya & Kaya, 2014):

- Digitalised education is important in terms of making education more accessible by saving time and place for the individuals who receive education and training.
- It is necessary to deal with the elements of the past and present process in education in detail and to educate students with a broad perspective in this way, digital elements are valuable helpers in this regard.
- In educational institutions, it is not always possible to reach all available students and to provide adequate educational support for them. For this reason, digital channels offer the opportunity to reach broad audiences at the same time.
- Geographical limitations in the process with digitalization in education are being removed.
- In digitalization, it is possible to present the contributions of all public and private sector-based education elements at the same time and more powerfully.
- Digitalization creates an element of equal opportunity in terms of renewing opportunities for individuals who think that they face various problems in getting education because of their age.
- The cost of educational materials increases as the level of education increases. This case makes digital elements more easily and cost-effectively accessible.

When the literature is examined, it is noteworthy that there are academic studies on digitalization in education in Northern Cyprus; they are summarised in the following paragraphs.

Oroja, Kotoua, and Ilkan (2011), in their study, examined online education in Northern Cyprus universities with an example of Eastern Mediterranean University. In the study, a case study was presented to measure the views on online courses at universities in Northern Cyprus. Data of student's doing online programmes was obtained from the registrar office, and an email was sent to students doing the online programme to fill in their opinions about their online programmes. The investigation was conducted for a period of 2 months in Northern Cyprus, Turkey and EMU; some of the departments selected were Banking and Finance, Hospitality Management, Information Management, Information Technology, Engineering and Distance Education Institute (EMU-DEI). At the end of the research, it was suggested that a marketing system should be put into use to improve online education at the

relevant university. It was also emphasised that students should be aware of online programmes and their educational benefits. In the same study, although as time goes on, online education will surpass traditional classroom work due to new technologies and the necessity of face-to-face education has been advocated in order to maintain the relationship between teacher and student.

Altınay, Dagli, and Altınay (2016), in their studies, examined the effect of digital transformation on school management and school culture in the case of North Cyprus. The article is an example of qualitative study. Content analysis was carried out to realize the upcoming issues in school management and digital transformation. This survey was carried out with 10 school administrators and 50 teachers from 3 rural area schools in Northern Cyprus. As a result, demanding for developing countries especially in North Cyprus, this research revealed that headmasters have awareness on the use of digital and technological facilities. They were aware of digital transformation, although the budget and application restrictions were revealed to apply this transformation.

Durusoy's (2011) 'Web 2.0 and Digital Video in Teacher Training Developing Teaching Self-Efficacy by Using Technologies' (master thesis) aimed to examine the effects of Web 2.0 technologies and digital video use on teacher candidates' self-efficacy in the teaching practice course. The study was conducted with 10 students studying at the Department of Computer Education and Instructional Technologies. The lectures of the students were videotaped three times at regular intervals and these images were shared on 'Facebook', a Web 2.0-based social network. In order to examine the development of teacher candidates' self-efficacy, qualitative data were taken from the comments made on the video by the students, the practice teachers and the instructor. As a result; it has been determined that there is a positive change in the digital skills of teacher candidates and qualitative data support this.

Uzunboylu and Hursen (2011) aimed to develop a scale for teachers' lifelong learning competencies and examine the validity and reliability structure of the scale. The study group of the research consisted of 300 secondary school teachers working in secondary schools within the borders of Northern Cyprus. Findings related to the construct validity of the scale were analysed by the factor analysis method. As a result of the analysis, the lifelong learning competencies scale consisting of 6 sub-dimensions consisted of 51 items. The six sub-dimensions determined are as follows: "self-management competencies", "learning to learn competencies", "initiative and entrepreneurial competencies", "knowledge acquisition competency", "digital competencies" and "decision-making competencies". Uzunboylu and Hursen (2011) obtained six dimensions in the Lifelong Learning Competencies scale they developed. Cronbach's Alpha reliability coefficient of the scale was calculated as 0.95. According to the validity and reliability analyses made, it has been determined that the scale has usable features. Two of these dimensions are the "competencies on acquiring information" and "digital competencies". Some of the items of the relevant dimensions are as follows:

I. Competencies on Acquiring Information

- A: Facilitate transition of information via email;
- B: Access to information on internet through search engines such as Google;
- C: Utilising mobile phones in accessing to new information;
- D: Benefit from social utility websites such as Facebook and Twitter in the process of gathering information.

II. Digital Competencies

- E: Ability to save data in computer;
- F: Ability to use Internet;
- G: Benefit from online internet tools such as online journals, newspaper and videos;
- H: Benefit from online news group;
- I: Ability to use chat programmes;
- J: Facilitate sharing information on internet with colleagues.

Two dimensions of the relevant scale were found to be important in terms of measuring digital competencies. Two of these dimensions are the 'competencies on acquiring information' and 'digital competencies'. When the items in the relevant dimensions are examined, 'Access to information on internet through search engines such as Google', 'Utilising mobile phones in accessing to new information', 'Benefit from social utility websites such as Facebook, Twitter in the process of gathering information' and 'Facilitate sharing information on internet with colleagues', draw attention. Cronbach's Alpha reliability coefficient of the scale was calculated as 0.95. According to the validity and reliability analyses made, it is determined that the scale has usable features.

Research was conducted TRNC Ministry of National Education and Culture General Secondary Education with teachers working in the department with teachers working under the Vocational Technical Education Department. As a result, it was emphasised that the Ministry of National Education and Culture, teachers, field experts and teacher training institutions should carry out active studies in order to strengthen the digital competencies of teachers and their competencies on acquiring information.

Uzunboylu and Selcuk (2016), in their study conducted attempted to handle the lifelong learning competence perceptions and self-efficacy beliefs of teacher candidates' within the scope of the teacher training programme and revealed the relationship between them. In the study, the Lifelong Learning Efficiency scale, whose validity and reliability studies were carried out, was developed. Cronbach's Alpha reliability coefficient of the scale was calculated as 0.93. According to the validity and reliability analyses made, it has been determined that the scale has usable features. The scale consists of 31 items and 4 dimensions. One of these dimensions is the "technology and digital competence". Some of the items of the relevant dimensions are as follows:

I. Technology and Digital Competence

A: I can benefit from technological tools in classroom activities;

B: I can research and use new technologies in my field;

C: I can be involved in social networks (Facebook, Twitter etc.) for cultural, social and professional purposes;

D: I can benefit from electronic resources (e-library etc.);

E: I can use information technology reliably;

F: I have ability to benefit from information technologies in professional development;

G: I have the competence to benefit from information technologies in professional development;

H: I can research and use new technologies in my field;

I: I can analyse data using information and communication technologies;

J: I can help my students gain legal and moral responsibilities related to information and communication technologies.

The Lifelong Learning Efficiency scale, whose validity and reliability studies were carried out, was developed. Cronbach's Alpha reliability coefficient of the scale was calculated as 0.93. According to the validity and reliability analyses made, it has been determined that the scale has usable features. The scale consists of 31 items and 4 dimensions. One of these dimensions is the 'technology and digital competence'. When the items in the relevant dimensions are examined, 'I can benefit from technological tools in classroom activities', 'I have ability to benefit from information technologies in professional development' and 'I have the competence to benefit from information technologies in professional development' draw attention.

As a result, most of the teacher candidates who participated in the interview in the study stated that lifelong learning competencies such as 'learning to learn', 'personal development and entrepreneurship', 'communication' and 'technology and digital' were partially acquired during their education.

Quantitative (digital) competence is the fourth main competence area of the European Union; it is supported by the basic skills of ICT, which includes the use of fetching, evaluating, storing, producing, presenting and sharing information from computers and communicating and participating in collaborative networks via the Internet (Gunuc et al., 2012; Hursen, 2011; Keser, 1988).

2.6 Digital Transformation and Teacher Competencies in North Cyprus

Along with digitalization, the concept of online distance education has been used frequently. Also, distance education by experiencing amitosis split created forms (Zawacki-Richter & Anderson, 2012). For example, electronic learning (e-learning) (Hirumi, 2002; Nichols, 2003), mobile learning (m-learning) (Quinn, 2011; Traxler, 2010) and accessible learning (a-learning) (Cardenas-Robledo & Pena-Ayala, 2018; Park, 2011) are concepts that emerge as a result of the amitotic split of distance education. From this point of view, the concept of digital education is shown in Figure 4.

As a result of applying the digitalization process to education processes and especially adapting it to distance education processes, new pedagogical approaches and new learning models are emerging (QAA, 2020). This change, which extends from traditional offline technologies to digital technologies, can evolve from face-to-face education to distance education based on digital and online technologies (Bozkurt & Sharma, 2020).

Designing an effective, efficient and attractive learning/teaching process in digital environments is not only related

to the use of tangible and intangible technologies, but also to digital competence, skills and literacy of the stakeholders involved in this process. Digital competencies are defined by the Joint Information Systems Committee (2012) as all competencies necessary to live, learn and work in a digital society, while Ferrari et al. (2012) consider digital competencies as a whole consisting of knowledge, skills and attitudes.

The most important stakeholder in the management of the process is undoubtedly the teachers. Basic field competencies are categorised according to Higher Education Competencies Framework and International Standard Classification of Education codes in Turkey and TRNC; however, one of the competence areas expected to be within the scope of teacher training and educational sciences-based competencies is 'developing a positive attitude towards lifelong learning', and 'using advanced information resources related to the field' is another expression defined for the skill area.

Another stakeholder of education examines the digital competencies of Cypriot Youth; at 78%, the digital skills of Cypriot youngsters are marginally below the EU 27 average of 80%, according to the figures released by Eurostat World Youth Skills Day (2020). Eurostat noted that over the recent months, many young people (aged 16–24) have had to follow online classes, as lockdown measures associated with the COVID-19 pandemic have prevented their schools, universities or other vocational and training institutions from running face-to-face teaching.

While educational activities are carried out at home remotely; with distance education and online courses, education life has turned to digitalization with the pandemic. In this context, the digitalization process that came with the pandemic process has affected all countries as well as Northern Cyprus. When the researches in Northern Cyprus related to the pandemic period and digitalization are examined;

Egeli and Ozdemir (2020), they presented a study titled an overview of the reflections of the coronavirus (Covid-19) pandemic process on the North Cyprus (TRNC) education system. In this study, the reflections of the covid-19 pandemic on TRNC education and the decision taken by the TRNC Ministry of National Education and Culture, Higher Education Planning, Supervision, Accreditation and Coordination Board (YODAK) and Education Unions in terms of sustainability in education in line with the new education paradigms that emerged in the post-pandemic period, implementation and the suggestions put forward are mentioned. At the end of the study, it was emphasized that the necessary in-service training and psychological support should be provided, especially in order to raise the awareness of teachers about adopting new learning environments and adapting to the digitalization process.

Tangul and Soykan (2021), in their study, they examined the opinions of teachers candidates about the digitalization process. A total of 38 primary school classroom teachers and 27 classroom teacher candidates in the last year of teaching programs in North Cyprus participated in the research. This descriptive study was designed as a case study, which is a qualitative research approach. As a result, the digital citizenship level of teacher candidates was also questioned and a high level result was obtained. In addition most of the pre-service teachers pointed out that they participated in the digitalization of learning and teaching environments after the pandemic process, and at this point, it is necessary to provide in-service trainings on digitalization from educational institutions.

3. Research Method& Methodology

This research is an example of a literature review. A literature review is a search and evaluation of the available literature in your given subject or chosen topic area (Arshed & Danson, 2015).

The purposes of this research:

- Questioning teacher training and competencies in the transition to the digital transformation process in Northern Cyprus and to introduce data collection tools used to measure digital competences and teacher-led changes.

The sub-purposes of the research are:

- Use of information and communication technologies and teacher competencies in education;
- Digitalization in education with ICT integration;
- Professional development programmes and teaching education in digital transformation;
- Teacher education and competencies in North Cyprus;
- Digital transformation in education in North Cyprus;
- Digital transformation and teacher competencies in North Cyprus.
- To discuss the level of digital competencies in the pre-service teacher/pedagogical student population and the ways to measure them through research conducted in the TRNC.

Within the scope of all these purposes and sub-purposes; it is thought that determining the competencies of teachers and the tools measuring these competencies within the scope of the digitalization process will be effective in ensuring quality in education on behalf of Northern Cyprus in the future and will shed light on future research.

4. Result, Discussion and Suggestions

In this study, teacher education and competencies are questioned in the transition to the Digital Transformation Process in Northern Cyprus. In addition, tools for measuring digital competencies and teacher-oriented changes introduced. Education has an important place and importance both in the academic field and in the institutional field. The digital transformation of education in the academic field provides the formation of a new and experiential bridge between the teacher and the student, while supporting the learning independent of time and place for professionals in the institutional field.

First of all, digital transformation, which is the keyword in the research, accompanying compulsory change in education was discussed. The next step was the digital competencies of teachers and/or teacher candidates, who are the most important stakeholders of education with the digital transformation in our age, were questioned. Then, mentioning the existence of globally qualified standards for digital competencies (ISTE Report; ICT Competencies Standards for Teachers by UNESCO) more specifically, in the process of digital transformation, the educational competencies of teachers and or teachers candidates in Northern Cyprus have been interpreted with relevant references. Accordingly, the following important results were obtained in the study.

In the digital transformation process in Northern Cyprus, it has been determined by literature research that there are studies in both higher education and basic education level to interpret or determine the digital competencies of teachers and/or teacher candidates. Related studies and their results are included and discussed in the theoretical framework of the research. With regard to the common result of these studies, the indisputable understanding of the importance of digitalization in the field of education by institutions and organisations in the developing world and especially in the pandemic process and in order to realise adaptation to this digitisation process, it is necessary to start with teacher education, which is the most important stakeholder of education. As common suggestions of these studies, it was emphasised that the Ministry of National Education and Culture, teachers, field experts and teacher training institutions should carry out active studies in order to strengthen the digital competencies of teachers and their competencies on acquiring information. When the studies conducted in TRNC on the level of digital competence and measurement methods in the teacher candidate/pedagogical student population are evaluated, two measuring instruments draws attention.

When the research studies in the literature on the subject are examined, it is seen that teachers or teacher candidates attach importance to the digitalization process and emphasize the necessity of receiving in-service training to adapt to this process.

Suggestions for the research are listed below:

- In the literature review, although the existence of studies belonging to Northern Cyprus in measuring the digital competence of teachers/teacher candidates' is remarkable, it has been determined that there are not enough numbers according to the importance of the subject. Considering the rapid transition and adaptation to the digital transformation process, especially during the pandemic period, since teachers are the most important part of digital education, it is foreseen that more qualitative or quantitative research is needed to interpret and measure digital competencies.
- In this context, researches can be developed/supported that question teachers' attitudes, beliefs and self-efficacy towards the digitalization process and/or educational environments.
- In addition by investigating the dimensions of digital competence, each dimension can be discussed in detail and valid and reliable data collection tools (survey, scale, interview form etc.) can be developed.
- Finally, in general suggestion, in particular, the relevant institutions in the TRNC (TRNC Ministry of National Education, TRNC Higher Education Institutions, Higher Education Planning, Supervision and Accreditation and Coordination Board (YODAK) for the professional development of teachers in every field should increase the quality standards in the profession in cooperation with each other.

Apart from these, in order to keep pace with these developments in the world of education;

- Devices or applications used in the digital transformation of education are only tools. Transformation cannot be expected to occur only by expanding the use of these tools. Therefore, in this context, it is necessary to focus on the content, software and the quality of the educators rather than the device used.
- Students should be encouraged in technical production and supported with positive production, digital

literacy and content production skills.

- Digital transformation is not possible with tablets and applications, but with dynamics and changes on dynamics.
- Digital transformation in education should not be perceived as a revolution that will take place in a short time, but should be seen as a long-term evolution.
- The process should be managed and directed by professional/academic circles.

References

- Ahmad, M., & Murray, J. (2019). Understanding the connect between digitalization, sustainability and performance of an organisation. *IJBEX*, 17(1), 83-96. <https://doi.org/10.1504/IJBEX.2019.10017927>
- Altınay, Z., Dagli, G., & Altınay, F. (2016). *Digital Transformation in School Management and Culture*. In book: Virtual Learning. Published by Intech Open Science. <https://doi.org/10.5772/65221>
- Ayaz, M. F., Oral, B., & Söylemez, M. (2015). Türkiye’de öğretmen eğitimi ile ilgili yapılmış lisansüstü tezlerin değerlendirilmesi. *Elementary Education Online*, 14(2), 787-802. <https://doi.org/10.17051/ieo.2015.89009>
- Balyer, A., & Oz, Ö. (2018). Academicians’ views on digital. transformation in education. *International Online Journal of Education and Teaching*, 5(4), 809-830. Retrieved from <http://iojet.org/index.php/IOJET/article/view/441/295>
- Barnett, R. (2010). Knowing and Becoming in the Higher Education Curriculum. *Studies in Higher Education*, 34(4), 429-440. <https://doi.org/10.1080/03075070902771978>
- Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to Coronavirus pandemic. *Asian Journal of Distance Education*, 15(1), 1-6. <https://doi.org/10.5281/zenodo.377808>
- Business Innovation Report. (2021). Retrieved from https://unctad.org/system/files/official-document/tir2020_en.pdf
- Cárdenas-Robledo, L. A., & Peña-Ayala, A. (2018). Ubiquitous learning: A systematic review. *Telematics and Informatics*, 35(5), 1097-1132. <https://doi.org/10.1016/j.tele.2018.01.009>
- Chorosova, O. M., Aetdinova, R. R., Solomonova, G. S., & Gerasimova, R. E. (2020). Spring 2020: Toward a Digital Transformation of Education. *Proceedings IFTE-2020*, 0381-0393. <https://doi.org/10.3897/ap.2.e0381>
- Clement, S. G. (2017). *Digital Learning Education and Skills in the Digital Age*. Cambridge: RAND Corporation.
- Durusoy, O. (2011). *Öğretmen yetiştirmede web 2.0 ve dijital video teknolojilerinin kullanılarak öğretmenlik öz-yeterliğinin geliştirilmesi* (Unpublished master’s thesis). Balıkesir University Institute of Science and Technology. Turkey. Retrieved from <https://www.ulusaltezmerkezi.net/ogretmen-yetistirmede-web-2-0-ve-dijital-video-teknolojilerinin-kullanilarak-ogretmenlik-oz-yeterliginin-gelistirilmesi/>
- Eurostat World Youth Skills Day. (2020). *Do young people in the EU have digital skills?* Retrieved from <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20200715-1>
- Ferrari, A. (2012). *Digital Competence in practice: An analysis of frameworks*. EC JRC IPTS, Seville, Spain. Retrieved from https://www.researchgate.net/publication/282860020_DIGCOMP_a_Framework_for_Developing_and_Understanding_Digital_Competence_in_Europe
- Gao, P., Tan, S. C., Wang, L., Wong, A., & Choy, D. (2011). Self reflection and preservice teachers’ technological pedagogical knowledge: Promoting earlier adoption of student-centred pedagogies. *Australasian Journal of Educational Technology*, 27(6), 997-1013. <https://doi.org/10.14742/ajet.925>
- Gunduz, S., & Atas H. (2020). Delphi yöntemi ile eğitimde dijital dönüşümün etkilerinin tartışılması. *Social Sciences Studies Journal*, 6(61), 1672-1684. <https://doi.org/10.26449/sss.2246>
- Gurtekin, P., & Baskan, G. (2013). The History of Turkish and Cyprus Turkish Education Teacher Training Policies Teacher Training in National Education Councils and Development Plans. *Procedia - Social and Behavioral Sciences*, 89. <https://doi.org/10.1016/j.sbspro.2013.08.941>
- Güvenç, H. (2011). Öğretmen Adayı Öğrencilerin Mesleki Öz-Yeterlilik Algıları ile Öğrenci Başarısı Sorumluluk Algıları. *E-Journal of New World Sciences Academy Education Sciences*, 9(3), 311-322. Retrieved from <https://dergipark.org.tr/pub/nwsaedu/issue/19820/212074>

- Hirumi, A. (2002). Designing and sequencing elearning interactions: A grounded approach. *International Journal on E-Learning*, 1(1), 19-27. Retrieved from <https://www.learntechlib.org/primary/p/8390/>
- Hursen, C. (2011). *Öğretmenlerin Yaşam Boyu Öğrenme Yaklaşımına Yönelik Görüş Tutum ve Yeterlik Algılarının Değerlendirilmesi* (Unpublished Doctoral Thesis). Near East University, Institute of Educational Sciences, Nicosia.
- Information Systems Committee (JISC) Report. (2012). Retrieved from https://www.researchgate.net/publication/228728377_Joint_Information_Systems_Committee_Project_Report_Digital_Repository_Management_Practices_User_Needs_and_Potential_Users_An_Integrated_Analysis
- International Management Development Institute Report. (2017). Retrieved from <https://www.investopedia.com/terms/i/imd.asp>
- Ireland Ministry of Education. (2015). Retrieved from <https://www.education.ie/en/Press-Events/Press-Releases/2015-Press-Releases/PR2015-05-25.html>
- ISTE. (2008). *National educational technology standards for teachers*. Eugene, OR. Retrieved from <https://www.iste.org/iste-standards>
- ISTE. (2012). *National educational technology standards for teachers*. Eugene, OR. Retrieved from <https://www.iste.org/iste-standards>
- Karabacak, Z., & Sezgin, A. (2019). Türkiye’de dijital dönüşüm ve dijital okuryazarlık. *Turkish Journal of Administration*, 319-342. Retrieved from <https://app.trdizin.gov.tr/publication/paper/detail/TXpNMU16STRPQT09>
- Karoglu, A., Cetinkaya, B., & Cimsir, E. (2020). Toplum 5.0 Sürecinde Türkiye’de Eğitimde Dijital Dönüşüm. *Journal of Research Universities*, 3(3), 147-158.
- Kaya, A., & Kaya, B. (2014). Öğretmen adaylarının dijital vatandaşlık algısı. *International Journal of Human Sciences*, 11(2), 346-361. <https://doi.org/10.14687/ijhs.v11i2.2917>
- Keser, H. (1988). *Bilgisayar Destekli Eğitim için Bir Model Önerisi* (Doctoral thesis, Ankara University Institute of Social Sciences, Ankara).
- Kohli, R., & Melville, N. (2009). Digital innovation: A review and synthesis. *Information System Journal*, 29(1), 200-223. <https://doi.org/10.1111/isj.12193>
- Leviäkangas, P. (2016). Digitalization of Finland’s transport sector. *Technology Society*, 47(1), 1-15. <https://doi.org/10.1016/j.techsoc.2016.07.001>
- Nichols, M. (2003). A theory for eLearning. *Educational Technology & Society*, 6(2), 1-10. Retrieved from <http://ifets.ieee.org/periodical/6-2/1.html> ISSN 1436-4522
- Oksuz, Y., Demir, E. G., & İci, A. (2016). Öğretmenlerin ve öğretmen adaylarının çok kültürlü eğitim kavramına ilişkin metaforlarının incelenmesi. *Electronic Journal of Social Sciences*, 15(59), 1263-1278. <https://doi.org/10.17755/esosder.263230>
- Oroja, S. G., Kotoua, S., & Ilkan, M. (2011). Online Education in North Cyprus Universities: Case Study Eastern Mediterranean University. *Procedia-Social and Behavioral Sciences*, 28, 536-541. <https://doi.org/10.1016/j.sbspro.2011.11.103>
- Park, Y. (2011). A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types. *International Review of Research in Open and Distributed Learning*, 12(2), 78-102. <https://doi.org/10.19173/irrodl.v12i2.791>
- QAA. (2020). *Guidance*. Retrieved from <https://www.qaa.ac.uk/docs/qaa/guidance/preserving-quality-and-standards-through-a-time-of-rapid-change.pdf>
- Quinn, C. N. (2011). *Designing mLearning: Tapping into the mobile revolution for organizational performance*. Hoboken, NJ: John Wiley & Sons.
- Tacman, M., & Comunoglu, N. (2021). Class teachers expectations from teacher candidates from three points of views. *Cypriot Journal of Educational Sciences*, 10(3), 282-293. <https://doi.org/10.18844/cjes.v1i1.73>
- Taskıran, A. (2017). Dijital çağda yükseköğretim. *Journal of Open Education Applications and Research*, 3(1), 96-109. Retrieved from <https://dergipark.org.tr/pub/auad/issue/34114/377387>

- Traxler, J., & Wishart, J. (2011). *Making Mobile Learning Work: Case Studies of Practice*. Bristol: ESCalate, HEA Subject Centre for Education, University of Bristol.
- TUBİTAK Bilgem. (2019). *Dijital dönüşüm nedir?* Retrieved from <https://www.sdijitalakademi.gov.tr/>
- Türk Eğitim Derneği [Turkish Education Association]. (2009). *Oğretmen yeterlikleri raporu* [Teacher Competencies Report]. Ankara: Turkish Education Association Publication.
- UNESCO. (2008). UNESCO. Retrieved from <https://en.unesco.org/news/dealing-obstacles-distance-learning>
- Uzunboylu, H., & Hürsen, Ç. (2011). Yaşam Boyu Öğrenme Yeterlik Ölçeği (YBÖYÖ): Geçerlik ve güvenilirlik çalışması. *Journal of Hacettepe University Faculty of Education*, 41, 449-460.
- Uzunboylu, H., & Selcuk, G. (2016). Lifelong Learning Competency Perceptions of Teacher Candidates According to a Teacher Training Program. *Anthropologist*, 22(1), 119-125. <https://doi.org/10.1080/09720073.2016.11891997>
- Zawacki-Richter, O., & Kourotchikina, A. (2012). The Russian higher education system and the development of distance education in the Russian Federation and the former Soviet Union. *International Review of Research in Open and Distance Learning*, 13(3), 165-184. <https://doi.org/10.19173/irrodl.v13i3.1165>

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