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DIGITAL COMPETENCES OF FUTURE TEACHERS IN THE REPUBLIC OF NORTH MACEDONIA⁸⁴

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Abstract

In the last two decades, information sciences have gained special importance in the field of education. This was especially felt by the teachers who had to adapt to the new values brought by the integration of ICT in all segments of modern life, but especially in teaching. During this period, teachers had to create their own attitudes, skills, and values when using digital technologies and tools in their work. As a result of the rapid development of using ICT in education, the faculties in our country, which produce future teaching staff, had to adapt their curriculum to increase the digital competencies of future carriers of educational processes. This paper will focus on the current state of teachers' digital competencies and the skills they obtain during their studies to be able to cope with the convergence of digital teaching.

Introduction

The growing and accelerated application of new ICT technologies in almost all segments of society, largely came to the fore in education where should prepare all involved sides for the digital age, or technology-based society. In North Macedonia, the Covid-19 pandemic revealed lot of problems in the educational process, starting with numerous challenges in terms of the existence of information infrastructure, to the training of teachers for the application of digital technologies in their teaching. The focus was on the issue of digital education, which means having digital literacy, i.e., digital skills and competencies of teachers and students, as well as innovative pedagogy based on the use of new technologies in teaching.

According to the definition of UNESCO (Ansong-Gyimah, 2017) digital literacy is the ability to identify, understand, interpret, create and communicate computer content, as well as use printed and written materials related to different contexts. A digital competent person will have a number of skills: knowledge of the basic principles of computer hardware, skills in using computer networks, the ability to engage in online communities and social networks. Digital literacy does not replace traditional forms of literacy, it is just one of the new forms of modern literacy in the information age. Unlike computer and information literacy, the concept of digital literacy is recent. It has emerged and been defined in the last decade and mainly refers to the

⁸⁴ Specialized paper

use of the full range of digital technologies for information, communication and problem solving in all aspects of life.

To understand the key elements of digital competence and how to approach them, the European Commission in 2017 published the "The European Framework for the Digital Competence of Educators" (DigCompEdu) (Redecker, 2017). DigCompEdu is part of the *European Digital Competence Framework* (DigComp). DigComp defines digital competencies for all citizens in order to successfully achieve the goals of work, learning, leisure and community participation. All competencies (21 in total) are grouped into 5 areas of digital competence: Information and Information Literacy, Communication and Collaboration, Digital Content Creation, Security and Troubleshooting. DigComp provides a common reference for digital competencies in Europe. The aim is to help citizens and organizations identify the digital skills gap and how to overcome the problem.

The European Framework for the Digital Competence of Educators is intended to enable teachers to determine their level of competence in the digital field and thus to determine their individual need for further training. Of course, it must be understood that teachers must also adapt to new circumstances in an increasingly digital world. However, most of the competencies that need to be acquired are not just new methodologies, but also question the traditional image of teachers. There are many teachers for whom this is the first problem to overcome. The learning process can begin only after it is resolved and there is interest and enthusiasm for something new. "In order to reach this stage, it is necessary to be aware of the fact that this is a modern education for the next generation and the future of society, and that the change of society cannot be denied" (Council of Europe Higher Education, 2010).

DigCompEdu distinguishes three areas of competence for digital teachers:

- professional competence of teachers
- pedagogical competence of teachers
- students' competencies.

Digital competence has been gradually introduced in school curricula, assessment tests and classroom practice over the past decade. During the same period, the term underwent many types of researching that resulted in descriptions of digital skills as one of the five core school learning skills. The term has also been the subject of several academic processes of definition. Common to development in both politics and academia is that it largely refers to students' digital competence understood as the end product being conceived. Europe's digital transformation will accelerate with the rapid advancement of new technologies, such as artificial intelligence, robotics and cloud computing. As technology advances, digitalization is affecting the way people live, socialize, learn and work. That is why the lifelong development of digital competence is important. At the same time, the proper use of digital technologies in education can be beneficial for the teaching and learning processes of all other competencies. Classrooms can open up to the world of research, industry and other cultures. Teachers and students can improve their competences through online resources and collaboration. The

European Commission assists teachers, schools, policymakers and other stakeholders with a range of online tools and resources. (Biberhofer et al., 2019).

Current state of North Macedonia education

In our country so far, there has been almost no experience with digital competencies in the field of education of educational staff. In recent years, a relatively large number of strategic documents have been adopted to raise the quality of digital skills among both teachers and students. A significant number of actions are predicted in computer literacy, distance learning, etc., but no specific activities and measures are provided for introducing the study of digital competencies in the formal education system, i.e., no national platform has been established to support the entire education system. One document according to which the reforms take place at all levels in education in our country is the Strategy for Education 2018 - 2025. In the Strategy, gaining digital competences is mentioned only in the noted challenges in the higher education where it is stated that there are not enough opportunities due to incomplete legal framework and poor development of learning platforms. At this moment, there is preparation of national standard for the necessary achievements of pupils in the primary education, followed by the preparation of standards for the achievements of students in high school. Here, the Strategy is in line with the relevant documents from the European Commission in the domain of Digital Competences. The standards provided in the area of Digital Competences will serve not only for the development of curricula that are directly related to the field of ICT, but they will be incorporated in the curricula of all other subjects where it is necessary to develop knowledge, skills and attitudes in this area. As a part of USAID project for increasing teachers' competences in North Macedonia, two publications were issued *Basic Professional Competencies for Teachers* and *Competencies for Principals in primary and high schools* where is tendency for certain digital competencies to be incorporated in the future teachers training. (MCEC, 2016)

According to the Eurydice report from 2019 (European Commission, 2019), most of the European education systems have included digital competencies as a subject and have included 13 learning outcomes. Although all education systems have some sort of strategy for monitoring and assessing the achievement of digital competencies, it is usually part of a more comprehensive strategy in Eastern European countries, while in others (mostly from Western, Central and Northern Europe) it is a separate strategy. In the Republic of North Macedonia, digital competencies according to the program documents are acquired through a special subject (compulsory and elective) and as an interdisciplinary lesson in all levels of education.

In terms of school support, most countries plan investments in digital infrastructure, and only one third envisage training measures for school management to promote digital competences. About half of the countries have policies to support and engage the so-called digital coordinators performing technical and pedagogical function. The situation is similar in our country. At one time all schools were equipped with a large number of computers (government program: Computer for every child), but today most computers are either obsolete or not in use. All teachers received training in basic ICT skills, and the principals in their training also

have a training module for using ICT in their work places. In most of the educational systems, and also in our country, teachers are expected to be digitally literate, and digital competencies that are specific to teachers are recognized as part of the basic competencies of teachers. Although the definitions and scope of skills are different, they all suggest that teachers need to know how to integrate digital technologies into teaching and learning and be able to use them effectively. The authorities are responsible for ensuring continuous professional development in relation to digital education through various initiatives that focus on different aspects of the digitalization of society. Teacher networks dedicated to digitalization in education have been established in several Balkan countries. In our country, the application of ICT in teaching at one time was one of the priorities in education, some of the teachers attended appropriate trainings, but such trainings are not offered as part of professional development. In general, the assessment of digital competencies in teaching is a process that provides teacher autonomy and is insignificantly regulated by higher education authorities.

In our country, the knowledge and skills acquired within the subjects are assessed: Basic computer use, Introduction to programming and Informatics in all level of education. As we can see no digital competencies are demonstrated. The OECD Education and Innovation Survey entitled "Teachers as Designers of the Learning Environment" (OECD, 2019) offers guidance that can help develop educational policies and improve the educational process. The research emphasizes that pedagogy is crucial for the realization of the teaching and learning process, as well as for defining educational policies. Namely, educational policies recommend and support the approaches in pedagogy in order to achieve the educational goals and the predicted results. The goal is for students to have higher educational achievements, attitudes and competencies needed to live in a modern digital society and to be able to learn for life. The research focuses on pedagogical innovations in education, which guide and are important in the process of introducing a change in the way of learning and teaching. Pedagogical innovations require fundamental changes in teachers' practices and their role in the progress of teaching. This way, teachers use and combine a series of methods, approaches, practices and techniques to achieve complex goals. Research suggests that this requires deep expertise and understanding, not just a routine of implementing techniques. The introduction of innovative approaches influences teachers and the way they teach. The research emphasizes that neither the use of ICT nor the technology applied alone improves learning. Innovation in pedagogy means changing the practices and roles of teachers. Learning communities or networks need to be established to support transformation through the development of pedagogical approaches, materials, knowledge sharing and leadership.

Related researches

North Macedonia is a member of the European Training Foundation (ETF) as part of the Western Balkans group. ETF contributes in reforming skills and education policy for a brighter future in educational processes in North Macedonia. ETF with its strategic approach connects digital skills and provides competencies through the use of digitally innovative teaching and learning methods. At the webinar "Learning digital skills", held on June 17, 2020, the topic was the development of digital competencies in the countries of Southeast Europe, so our

country was part of this group. From this webinar, two researches can be singled out, which include the Republic of North Macedonia. Kastrati (Кастрати, 2020) states "The Western Balkans need to go the extra mile and shape digital skills policies to respond to new technologies for the benefit of all." It is estimated that in European countries almost 90% of jobs require knowledge of certain digital skills, and 42% of the EU population still lacks basic digital skills. As a solution for the countries of the Western Balkans, where digital competencies are at a very low level and there are still no dedicated strategies, the instructions are clear - the study of digital competencies must be imposed through education development strategies, primarily among educational service providers and then in all other segments of the educational process. Measures must be impact-oriented at national and regional level. Sharic (Шариќ, 2020) clearly states that the strategies for the development of education in every Balkan country must change and focus on the development of digital competencies, especially among the bearers of the educational process. According to her, the needs must be analyzed at three levels: individual (self-assessment of teachers), school (school self-evaluation, external assessment) and national (assessment of ministries), and then set Digital Competence Standards for the teaching profession.

Zherevska, (MIA, 2021) in her study clearly emphasizes the need for information and digital literacy as priorities of the education system and assesses that the forced teaching at home due to the pandemic accelerated the reform process and showed the importance of digital technologies in education, and also gained insight into the shortcomings of the current education system. Innovative digital methods must be tailored to their needs. This is an opportunity to be used in order to design a modern educational system that will follow the tendencies of modern times, referring to the pedagogical aspect of the new methods based on digital pedagogy. We need teachers who are educated in digital skills and we need an infrastructure that will be standardized and the same for every school and every student. This means, she adds, that they will be able to more easily adapt to changes in the world, to have well-paid places and to continuously develop, i.e., to be part of lifelong learning.

Kordalov (MIA, 2021) shares the view that digital literacy is an important, and perhaps the most important segment we must work on in reforming education. The importance of knowledge and advanced application of digital skills by today's students mean great importance to be able to work in the professions of the future. According to Eurostat statistics, 64% of young people in Macedonia aged 16 to 24 have basic or above basic digital skills, and in more developed countries this percentage is over 90. It is time for ordinary and traditional lectures that are filled with only statistics and numbers to be enrich with digital content, and for that you need a digitally educated teaching staff. Therefore, the curriculum must be changed in higher education and the creation of a national curriculum of teaching content related to the development of digital competencies of teachers.

Professor Trajkovic, (MIA, 2021) who is also a top international expert, agrees that the pandemic focuses on digital literacy, but says it is just a tool, perhaps more complex, but essentially similar to others tools used in education. As a tool, it provides access to, use and creation of digital educational resources. Traditional pedagogical principles in lesson organization, interaction, monitoring student activities and assessment must be transformed.

According to the Eurydice 2019 Report on Digital Education in Europe, which covers 43 countries including North Macedonia, in 2/3 of the educational systems digital competencies are included in the general framework for competencies of teachers, and this includes our country.

Digital competencies of future teachers

As a result of digital innovations, in addition to the professional qualifications that students acquire by completing their studies at the Faculty of Pedagogy, it is necessary to possess a number of other skills, especially digital competencies, i.e., the ability to use digital technologies in order to transfer their knowledge to their students and digitally educate them.

In the Republic of Northern Macedonia there are four pedagogical faculties (Skopje, Bitola, Tetovo and Stip) that produce primary and secondary school teachers. The stated goals, priorities and activities in the Education Strategy 2018 - 2025 can be considered as a starting point and framework for planning the implementation not only of specific activities but also their expansion and incorporation of digital competencies in study programs.

Previous research has shown that these institutions lack the acquisition of digital competencies, but according to the Strategy in the future they will have to be included in the program. As the needs for the study of digital competencies in primary education change, so do appropriate subjects in the higher education. These are the competences that students now acquire at the pedagogical faculties in North Macedonia according to the DigCompEdu Framework:

- use digital technologies to enhance organizational communication with learners, parents and third parties.
- use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experiences and collaboratively innovating pedagogic practices.
- use digital sources and resources for continuous professional development.
- to identify, assess and select digital resources for teaching and learning
- to organize digital content and make it available to learners, parents and other educators.
- to plan for and implement digital devices and resources in the teaching process, so as to enhance the effectiveness of teaching interventions.
- to use digital technologies and services to enhance the interaction with learners, individually and collectively, within and outside the learning session
- to use digital technologies for formative and summative assessment.
- to use digital technologies to provide targeted and timely feedback to learners
- to incorporate learning activities, assignments and assessments which require learners to effectively and responsibly use digital technologies
- to empower learners to manage risks and use digital technologies safely and responsibly.

According to DigCompEdu these are just a few of the competencies that a modern teacher should have. However, it must be noted that the pedagogical faculties are faster adapting to the demand of modern trends and regularly implement digital competencies in their curricula.

Summery

In order to develop into "21st century teachers", students of pedagogical faculties need to be fully supported in the acquisition of digital competencies (both pedagogical and information).

First of all, it is necessary to provide basic conditions and technical means for conducting quality teaching. Then, it is necessary to train teachers for information literacy and data comprehension: browsing, searching and filtering data, evaluating data, information and digital content management, Professional support for teachers and professional associates should be provided through accredited training programs by the Bureau for Development of Education, as well as through direct professional and advisory assistance by advisors from the Bureau for Development of Education and the Center for Vocational Education and Training. ICT and digital competencies are developed in the seventh pillar of the National Strategy, so-called General priorities in the education system. Hence, one of the priorities (Priority III) set out in the Action Plan, which is an integral part of the Strategy, is to ensure the widespread use of ICT in education and digital competences. As sub-priorities, among others, are identified: Use of ICT in the learning process, Establishment of a unified electronic platform for teaching and learning and methodological resources.

This paper emphasizes the need for digitalization of practical teaching, but also of resources for learning. Namely, it will be a great advantage if there is institutional platform that connects all pedagogical faculties to enable simplified management of the entire study and learning process, avoiding administrative procedures, allowing access to digital learning resources, equipping laboratories with the latest technologies for learning and practical training, as well as digital communication among teachers, but also with the rest of the students.

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