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## DIGITAL COMPETENCE FEATURES OF TEACHERS IN HUNGARY AND NORWAY

### ABSTRACT

*Digital competence is one of the eight key competences (Recommendation of the European Parliament and of the Council on Key Competences for lifelong learning, 2006) and refers to the confident and critical usage of the full range of digital technologies for information, communication and basic problem-solving in all aspects of life. This may sound simple to many of us but, according to the Digital Agenda Scoreboard 2015, 40% of the EU population has an insufficient level of digital competence, including 22% who do not use the Internet. It is also important to consider that as a transversal competence, digital competence also helps us master other key competences, such as communication, language skills, or basic skills in maths and science. The article is devoted to the problems of teacher digital competence features in education of Norway and Hungary. The European Union Council Framework Program on new key competences for lifelong learning and structure of ICT competence of teachers (UNESCO Recommendations) are highlighted. European Research Center of the European Commission, which organized a working group, developed and presented a Digital Competence Framework for citizens (DigComp) are considered. We were shown that in a digital environment of Hungary teachers can apply digital technology methods and tools. That is why the Government of Hungary was created appropriate legislation, for example: The Resolution of the Ministry of Human Resources "On Common Requirements for Teacher Training and Initial Requirements for Certain Pedagogical Faculties"; The Teacher Career Model; Digital Education Strategy and its projects. Attention is drawn to the fact that the monitoring and evaluation of digital competence of teachers in the educational process at the national level, specially created Norwegian Centre for ICT in education. The content and process using online tools for self-evaluation of digital competence of teachers are described. The examples of estimation of digital competence through online tools «Teacher Mentor» are presented. Recommendations for the use of progressive ideas of the Hungarian and Norwegian experience for the education system of Ukraine are outlined*

**Keywords:** digital competence, ICT, teachers, students, education, Norway, Hungary, Ukraine.



## АНОТАЦІЯ

*Цифрова компетентність є однією з восьми ключових компетенцій (за Рекомендацією Європейського Парламенту щодо ключових компетенцій для навчання впродовж життя, 2006) і потребує впевненого та критичного використання всього спектру цифрових технологій для вирішення інформаційних, комунікаційних та основних проблем в усіх аспектах життя. Для багатьох з нас це може здатися простим, але, згідно з Індексом цифрового порядку денного (2015), 40% населення ЄС має недостатній рівень цифрової компетентності, у тому числі 22% не користуються Інтернетом взагалі. Важливо врахувати, що цифрова компетентність допомагає нам оволодіти й іншими ключовими компетентностями, такими як спілкування, мовні навички чи базові навички математики та природничих наук. Саме тому стаття присвячена особливостям цифрової компетентності вчителя в Норвегії та Угорщині. Висвітлено Рамкову програму Ради Європейського Союзу щодо нових ключових компетенцій для навчання впродовж життя та структуру ІКТ-компетенцій вчителів (Рекомендації ЮНЕСКО). Окреслено Цифрову систему компетентностей для громадян (DigComp) Європейського дослідницького центру Європейської комісії. Нами висвітлено, що в цифровому середовищі Угорщини вчителі можуть застосовувати методи та засоби цифрових технологій. Саме тому урядом Угорщини було створено відповідне законодавство, з такими нормативними положеннями як: Постанова Міністерства людських ресурсів “Про загальні вимоги до підготовки вчителів та початкові вимоги до певних педагогічних факультетів”; Модель кар’єри вчителя; Стратегія цифрової освіти та інші. Обгрунтовано особливість діяльності Норвезького центру ІКТ в освіті для моніторингу та оцінки цифрової компетентності вчителів у навчальному процесі на національному рівні. З досвіду Норвегії нами окреслено процес використання Інтернет-інструментів для самооцінки цифрової компетентності вчителів за допомогою спеціальної онлайн платформи «Учитель-наставник». Викладено рекомендації щодо використання прогресивних ідей угорського та норвезького досвіду для системи освіти України на різних рівнях.*

**Ключові слова:** цифрова компетентність, інформаційно-комунікаційні технології, вчителі, студенти, освіта, Норвегія, Угорщина, Україна.

## INTRODUCTION

The fast development of the digital world has influenced for the need to use electronic facilities of communication, learning, service on a daily basis and, at the same time, caused a crisis in the education system that has led to a lack of resources and opportunities for teachers and students knowledge. We may think that the transition to digital education will take place if educational institutions are provided with the appropriate equipment, unfortunately, it is not. Digitalization of education is a complex institution-building activity that includes not only the infrastructure of educational institutions, but also the acquisition of digital literacy by teachers.

Using digital education tools, teachers can break out of the classroom, create cross-curricular projects with new teaching tools and materials. Collaboration on the Internet offers many opportunities not only for teachers but also for students. Proper use of technologies can reduce the learning gap between students with favourable and unfavourable socio-economic backgrounds. This can significantly increase students' motivation to learn.



Today, the Ministry of Education and Science of Ukraine is developing requirements for digital competence of teachers. So far, we are talking about a certain standard with a description and list of knowledge and skills with the disclosure of their components. Such a description is provided by the Concept of pedagogical education development (2018), as well as the action plan of New Ukrainian School until 2029 (2017). This will be a reference point for making changes in both teacher education and training programs.

In view of this, it is worth paying attention to the international experience, in particular the experience of Hungary and Norway, where the formation and development of digital competence of teachers for all subjects is a strategic task of education systems. We find interesting the work of international experts and organizations on the requirements for digital competence and the development of conceptual approaches and frameworks.

#### **THE AIM OF THE STUDY**

Substantiate the features of digital competence of teachers in Hungary and Norway. Formulate recommendations for the use of progressive ideas of the Hungarian and Norwegian experience for the education system of Ukraine.

#### **THEORETICAL FRAMEWORK AND RESEARCH METHODS**

Problems of using ICT technologies in the educational process are highlighted in the scientific works of Ukrainian authors, in particular V. Bykov, V. Bepalko, A. Hurzhiy, N. Morse, O. Spirin, etc. The scientific works a lot of foreign researchers (D. Grof, D. Wilms, D. Campbell, S. Herman, A. Ferrari, etc.), are devoted to the problems of formation and assessment of ICT competence at the level of general secondary education. Such scientists as R. Krumsvik, S. Ludwigsen, M. Sobi, I. Sronsen, O. Khatlevik, K. Flo, and others deal with the formation and development of digital competence in educational institutions in Norway and Hungary. To identify the features of digital competence of the current problem the method of analysis and synthesis of pedagogical methodological, social sources was used. The comparative method and method of generalization was applied to conclude the article.

#### **RESULTS**

On January 17, 2018, the European Parliament and the European Union Council approved the Framework Program on new key competences for lifelong learning. The list of these competences includes: 1) literacy; 2) language competence; 3) mathematical competence and competence in sciences, technologies and engineering; 4) digital competence; 5) personal, social and educational competence; 6) civic competence; 7) entrepreneurial competence; 8) competence of cultural awareness and self-expression (EU, 2018).

Let's turn our attention to digital competence. The definition of this concept in Ukraine and in the world is still under discussion. Among researchers, different names are used for a set of identical characteristics on digital competence, for example: ICT competence, information and digital competence, etc.

In the Framework Program of new key competences for lifelong learning (2018), digital competence is seen as confident, critical and responsible use and interaction with digital technologies for learning, professional activities (work) and participation in society life. It includes digital and information literacy, communication and collaboration, digital content creation (including programming), cyber security and problem solving (EC, 2018).

Note, that the Concept of the New Ukrainian School (2016) identifies 10 key competencies (the content of which requires personal realization, development, active



citizenship, social inclusion and employment which are able to ensure personal realization and lifelong success), which includes information and digital competence. It involves the confident, but at the same time critical use of information and communication technologies (ICT) for the creation, retrieval, processing, exchange of information at work, in public space and private communication. A great importance has information and media literacy, the basics of programming, algorithmic thinking, working with databases, acquiring Internet and cyber security skills, understanding the ethics of working with information (copyright, intellectual property, etc.).

In this context, we turn our attention to the “Structure of ICT competence of teachers. UNESCO Recommendations” (2018). The Recommendations describe three successive levels of teachers' development on ICT skills for pedagogical purposes, for example: acquisition of knowledge, deepening of knowledge, creation of knowledge (UNESCO, 2018).

It should be noted that significant work on the creation of framework documents in the field of education and employment is carried out by international organizations, including the European Research Center of the European Commission, which organized a working group, developed and presented a Digital Competence Framework for citizens (DigComp, 2013) (Ferrari, 2013 ). In 2016, it was conceptually updated and DigComp 2.0 was published, which contains a description of the five dimensions of digital competence, such as: (1) information literacy and data literacy; (2) communication and collaboration; (3) digital content creation; (4) security; (5) problem solving; updated terminology, conceptual model and examples of its implementation at the European, national and regional levels (Vuorikari, Punie, Carretero, & Van den Brande, 2016).

In 2017, the Digital Competence Framework for educators was created (DigCompEdu, 2017), which outlined the main forms and methods of developing participants digital competence in the educational process, teachers and students, as well as the principles of creating a digital learning environment in education (The European Commission's science and knowledge service, 2017).

The DigCompEdu framework focuses on teachers and educators at all levels of education from kindergarten to higher and postgraduate education, general and vocational, special needs education and in non-formal learning contexts. This framework defines 6 main areas in 22 components, which express the teacher competence.

It should be noted that according to the Hungarian government, digital transformation is not a choice, but an inevitable event. Competitiveness needs a new approach where digital technologies play a significant role in education, on the workplace and everyday life. Therefore, according to the Hungarian government, a digital environment should be provided in which teachers can apply digital technology methods and tools (Kormány előterjesztés, 2016). To do this, it is necessary to create appropriate legislation. Consider some of them.

The Resolution of the Ministry of Human Resources “On Common Requirements for Teacher Training and Initial Requirements for Certain Pedagogical Faculties” (2013) define eight competencies, and in each of these competencies indicated a digital competence (Magyarország. EMMI rendelet 8 (I. 30), 2013).

The Teacher Career Model (Pedagógus életpálya-modell, 2013), introduced in September 2013, reflects the teaching career as an extensive system divided into different stages. There are 78 indicators available for classification, 10 of which are directly related to the field of digital competence (PÉM, 2013).



The Hungarian government's comprehensive and coordinated program, the Digital Education Strategy (Magyarország Digitális Oktatási Stratégiája, 2016), deserves special attention. It provides government support in various areas: digital access, digital networks, digital knowledge, digital state, digital economy and strategies. The priority of the strategy is the development of digital literacy, covering all levels of the Hungarian education system, which will contribute to Hungary's competitiveness. It covers general education, vocational training, higher education, adult education.

The Strategy formulates a quality and fair vision of the Hungarian education system, general and specific goals, as well as the most important directions of development for each level. The most important internal elements of the system are: infrastructure, accessibility, digital competence of teachers, teaching systems, review and digital development of educational content and education management system.

The main goal of the Hungarian Digital Education Strategy is to ensure appropriate digital competence and media awareness among students and teachers, and the opportunity to lifelong developing of this competence. Accordingly, in order to increase efficiency, equity and efficiency, the teaching and learning process must receive digital support, and governance at all levels of state education must be based on digital technologies.

To ensure the acquisition of digital competence, the Strategy identifies five main areas of activity: 1) development of a product requirements system that supports the digital competence development; 2) development of training programs that encourage the digital competence development; 3) methodological support for teaching and learning based on ICT; 4) development of digital infrastructure; 5) development of digital central support services (Magyarország Digitális Oktatási Stratégiája, 2016).

The goals of the Digital Education Strategy of Hungary are implemented through a number of projects, organizations, programs, educational portals, platforms, etc. Consider some of projects implemented in Hungary with the supporting of the European Research Foundation and goals of the Digital Education Strategy:

1. Project HRDOP-3.2.5-17 "Career orientation, especially the development of MTMI skills and competencies in the state education system" - the development of new approaches in STEM-education and promotion of career growth in it. The amount of funding for this project is 8.00 billion forints (Csordás, 2018).

2. Project HRDOP-3.2.4-16 "Development of digital competencies" - a consortium aimed for developing the digital infrastructure of schools: supply and connection of digital equipment. The project also aims to develop some educational administrative platforms and teacher training courses. The amount of funding for this project is 45.35 billion forints (Csordás, 2018).

3. The project HRDOP-3.2.15-CCHOP-17 "Assessment of educational systems and digital developments" aims to identify and measure the necessary levels of students and teachers competence in digital education. The project identifies the necessary levels of digital competence that students must achieve at different stages of learning and make the necessary changes to the curriculum. The project creates tools for diagnosing the level of media literacy of teachers. In addition, one of the tasks is to develop benchmarks and tools for measuring the digitalization of educational institutions and the level of teacher's digital competence. The amount of funding for this project is 10.56 billion forints (Csordás, 2018).

4. Project EFOP-3.2.4-16-2016-00001 "Digital competence development" is aimed for updating pedagogical methods in teaching and learning; purposeful development of



teacher's methodological knowledge in order to spread digital pedagogy; provide educational institutions with modern IT infrastructure. The amount of funding for this project is 45.35 billion forints (Klebensberg Központ, 2016).

We should note that teacher training courses ensure the development of lifelong digital competence. Teachers in Hungary, as in Ukraine, need to receive a certain number of credits in accredited advance courses. Teachers are free to choose the courses they need. Among them are those aimed at the development of digital competence and we can say that they are quite popular among Hungarian teachers (according to the Ministry of Education in 2016, 205 groups were recruited with 3608 participants in these trainings). Here are some of them: the use of digital tools in kindergarten and primary school; development of digital literacy in the teaching of natural sciences; use of multimedia elements in the teacher work, etc. (Csordás, 2018).

We can admit that various tools are used for digital diagnostics of educational institutions in Hungary, the most popular of which are eLEMÉR and SELFIE. They help not only to identify problems that arise in digital education, but also encourage institutions to continuous self-assessment, innovation and self-development.

In Norway, digital competence is seen, as defined by the European Commission, as the confident application of information society technologies to work, leisure and communication. It includes basic skills in the field of ICT: the use of computers to receive, evaluate, save, produce, present and exchange information, communicate and participate in shared networks over the Internet (Ferrari, A. & Soby, M., 2013). The Norwegian Ministry of Education and Research has developed a "Digital Competence Program 2004–2008" (Program), for the implementation of which the Directorate of Education was responsible. The Norwegian National Secondary Education Curriculum, approved in 2006, identifies five main competencies that pupils should develop during the learning process: reading, writing, numeracy, speaking, and the use of digital tools. The framework for the five key competencies was published in January 2012, when the Knowledge Promotion Reform came into force (Ivanyuk, I. 2015). The document states that digital competence includes the following skills: acquisition and processing of digital information data, creation and processing of digital information data, digital communication, digital solution. The formation of these skills should take place during the study of the following subjects: Norwegian language, mathematics, science (physics, chemistry, biology), foreign language (English), social studies / geography / history (Ivanyuk, I. 2015). Following the completion of the Program, it was decided in 2010 to establish a national institution, The Norwegian Center for ICT in Education, to monitor the development of various aspects of digital competence in Norwegian Education.

The main purpose of the Center is to improve the quality of education, improve learning outcomes through the implementation of educational strategies using ICT in preschool, primary, secondary education and training programs for future teachers. The Center is responsible for organizing and conducting a number of monitoring studies (The Norwegian Centre for ICT in Education, 2020).

The Center has developed several online tools for monitoring, supporting and evaluating the use of digital technologies by administration of school and teachers. For example, the Center has developed an online self-assessment tool for teachers "Teacher Mentors". Each teacher has the opportunity to assess the level of own digital competence and receive suggestions for appropriate measures to improve it. "Teacher-mentor" consists of four sections: pedagogy and ICT (attitude to ICT in education; planning and teaching;



use of digital learning resources; formation the leadership in the digital environment); digital products (use of standard software; creative works; Internet and social media); digital solutions (confidentiality; ethics; intellectual property rights, resource valuation); digital communication (use of tools; ethics; language and culture). Each section contains four short overviews with descriptions of existing life situations (Ivanyuk, I. 2015).

The score is a five-level scale, where level 1 is the lowest and level 5 is the highest. These five levels are determined on the basis of a model for the competence development by researchers S. Hooper and L. Reiber (1995). The first level is "familiarization", when the teacher gets acquainted with new technologies, before using them. The second level is "loading", when the teacher begins to use and research technologies, evaluates their capabilities and limitations. The third level is "integration", when the teacher began to use new technologies in the learning process. The fourth level is "reorientation", when the teacher begins to critically evaluate his practice related to the use of new technologies. Teachers at this level often focus on testing and assessing pupil's achievement. The highest level is "evolution". Teachers have a constant practice of using ICT, trying to improve the methods of their use in the classroom.

The Norwegian experience of using online tools for monitoring and evaluating the development of teacher digital competence can be used by Ukrainian experts in the development of appropriate tools for education quality monitoring.

#### **CONCLUSIONS**

The development of digital technologies and society's demands for new knowledge require teachers to constantly develop digital competencies. Changing the legislative framework for digital competence standards published by UNESCO and adopted in the European framework of digital competences, development of relevant standards in Ukraine, giving the teacher the right to decide in which institutions to improve skills, help to identify new approaches for digital competence of teachers.

At the same time, the generalization of scientific research results made it possible to formulate scientific and methodological recommendations for the use of Hungarian and Norwegian progressive ideas for the development of teacher digital competence in Ukraine at the following levels:

– Legislative level: improvement of the current state legislation on digitalization of education, in accordance with the educational needs of Ukrainian society and European development trends; development of national standards and requirements for digital teacher competence.

– Organizational and pedagogical level: the presence of institutions (entities) that provide advanced training in the formation of digital competence; development of scientific, educational and methodical resources for the formation of digital competence; introduction of international, state projects on the use of digital technologies; development of IT infrastructure of education in Ukraine (hardware, software, including digital laboratories, connection to high-speed Internet, information and educational environments, etc.); creation of a single information and educational environment; creation of electronic national platforms and environments for exchange of experience, accumulation of electronic educational resources.

– Content-procedural level: motivation of the teacher to professional development, including digital competence; lifelong professional self-development in



mastering digital technologies and methods of their use and information culture in the educational process.

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