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The Scope and Structure of ICT and Digital Competencies in the New Ukrainian School

Обсяг та структура інформаційно-комунікативної компетентності в Новій українській школі

Summary*. The present article explores ICT competence which is among ten key competences which the New Ukrainian School defines as learning outcomes. According to the Conception of the New Ukrainian School, the task of each school subject is the development of these competences. Hence, it is of primary importance that foreign language teachers, English teachers in particular, be aware of the scope and structure of each competence as well as of the specific features of its development through teaching and learning English. The present article aims at outlining the scope and structure of ICT and digital competences in the New Ukrainian School. The present study employs descriptive-analytical review of the regulations in the field of foreign language education. More specifically, the research is based on the data of the analysis of the Conception of the New Ukrainian School, the National Standard for Basic Secondary Education, and Model educational programs for foreign languages. A strong emphasis is placed on the contribution English as a school subject makes to the development of ICT and digital competences. The conclusion is drawn that the scope of ICT and digital competences implies learners' competences that go beyond the use of ICT. Being one of the key competences of the New Ukrainian School, ICT and digital competences are viewed as a complex construct that embraces the ICT use, information and media competence; basic computational competences and fundamentals of digital citizenship. The article presents the learners' ICT competence model that describes the structure of the learners' ICT competence which includes technological skills, information skills, information value and ethics*

awareness and motivation. Hence, the ICT competence is reviewed as a body of knowledge, skills and attitudes that learners need in order to handle information effectively to learn throughout life and grow personally.

Key words: *competence, information and communication competence, New Ukrainian school, digital competence, digital citizenship, skills.*

Анотація*. У статті розглядається інформаційно-комунікаційна компетентність, яка відносяться до десяти ключових компетенцій, що визначають результати навчання в Новій українській школі. Оскільки відповідно до Концепції Нової української школи завданням кожного шкільного предмету є формування цих компетенцій, важливо, щоб вчителі іноземної мови, англійської зокрема, були обізнані з обсягом та структурою кожної компетентності взагалі, а також специфікою її формування за допомогою навчання англійської мови. Метою статті є визначення обсягу та структури інформаційно-комунікаційної компетентності в Новій українській школі, що досягається за допомогою дескриптивно-аналітичного аналізу ключових освітніх документів України, таких як: Концепція Нової української школи, Державний стандарт базової середньої освіти та Модельні навчальні програми для 5-9 класів Нової української школи. Основна увага звертається на роль англійської мови як навчального предмета у її формуванні. У статті робиться висновок, що обсяг інформаційно-комунікаційної компетентності не вичерпується простим вмінням користуватися інформаційно-комунікаційними технологіями. Нова українська школа розглядає її як складне утворення, що охоплює вміння користуватися інформаційно-комунікаційними технологіями, інформаційну та медіакомпетенції, базові обчислювальні компетенції та основи цифрового громадянства. У статті подається модель інформаційно-комунікаційної компетентності учнів, що визначає її структуру і включає такі компоненти: технічні вміння, інформаційні вміння, обізнаність щодо цінності інформації та інформаційної етики та мотивацію. Відповідно. інформаційно-комунікаційна компетентність розглядається як набір знань, вмінь та ставлень, що повинні сформувати учні для того, щоб ефективно виконувати необхідні дії з інформацією з метою особистого розвитку та безперервного навчання.*

Ключові слова: *компетентність, інформаційно-комунікаційна компетентність, Нова українська школа, цифрова компетенція, цифрове громадянство, вміння.*

Introduction. The introduction of the new law “On Education” in 2017 followed by the law “On Complete General Secondary Education” in 2020 initiated far-reaching reforms in the field of school education in Ukraine aimed at establishing New Ukrainian School (NUS). The ultimate goal of the New Ukrainian School Reform is postulated as mainstreaming competency-based learning and life skills schooling [90, p. 90; 16, p. 13] in order to ensure “the comprehensive development, education and formation of individuals who perceive themselves as citizens of Ukraine, capable of living in the society and interacting with nature in a civilized way, aspire for self-perfection and life-long study, are ready for

a conscious life choice and self-fulfilment, labour activities and community involvement" [14, p. 5].

The basic NUS document of the Ministry of Education and Science of Ukraine outlines 10 key competences learners are expected to develop as a result of schooling: 1) communication in the national language (and mother tongue, if different); 2) communication in foreign languages; 3) mathematical literacy; 4) competencies in science and technology; 5) ICT and digital competencies; 6) lifelong learning skill; 7) sense of entrepreneurship; 8) social and civic competencies; 9) cultural awareness and 10) environmental awareness and healthy lifestyle [14, p. 11–12]. Hence, NUS ranks ICT and digital competences among learners' essential skills of the 21st century.

This paper **aims at** defining the scope of ICT and digital competences in the NUS curriculum and exploring its structure.

Methodology. The present study employs descriptive-analytical review of the regulations in the field of foreign language education. More specifically, the research is based on the data of the analysis of the Conception of the New Ukrainian School (CNUS) [14], the National Standard for Basic Secondary Education (the National Standard) [21], and Model educational programs for foreign languages [22; 23]. The results of the descriptive-analytical review of the national regulatory framework in the EFL teaching field are used to identify the scope of ICT and digital competencies learners are expected to acquire at the level of basic secondary education and outline the role EFL teaching has in it.

Results and Discussion. According to CNUS, the New School Formula consists of nine key elements [14, p. 7]:

1. New educational content establishing solid foundation for the development of the competencies necessary for learners' successful self-fulfilment in society.
2. Motivated teaching staff who enjoy freedom of creativity and professional development.
3. A cross-cutting educational process that informs values.
4. Decentralization and effective administration that will bring real autonomy to schools.
5. Teaching based on partnerships between the pupil, the teacher and parents.
6. A focus on pupil's needs in the educational process, i.e. child-centered education.
7. A new school structure that allows to master the new content and acquire life competencies.
8. Fair allocation of public funds that ensures equal access to quality education for all children.

9. A contemporary educational environment that will provide necessary conditions, means, and technology for education of pupils, teachers, and parents, not only in the premises of the educational establishment.

The basic idea is that the NUS main mission is ensuring the necessary conditions for learners to develop competencies and skills that will ensure their self-actualisation and self- fulfilment in 21st century personal, professional and civic environments. Unlike traditional education, NUS schooling is intended to equip learners with the abilities rather than provide them with knowledge.

ICT is on the list of the key competencies the NUS strives to foster. The CNUS describes it under the heading of "ICT and digital competencies". The National Standard for Basic Secondary Education deals with the concept within the framework of "information and communication competence". The CNUS places a strong emphasis on the learners' ability to handle information, while the National Standard treats information and communication competence as a tool a learner is expected to employ in order to develop and communicate. In particular, according to the description provided by the CNUS, ICT and digital competencies include a wide range of skills which are required to produce, research/ process and exchange information in different settings: at work, at studies, in personal communication and in public domain [14]. The National Standard describes information and communication competence as the ability to use digital technologies in a confident and responsible way in order to grow personally and communicate as well as to use information and communication means in a safe way in a learning and everyday environments according to the principles of academic good practice [21].

In order to define the scope of ICT and digital competencies as provided for by the national regulatory framework in the field of secondary education, let us analyse the relevant definitions and descriptions.

The CNUS states that "ICT and digital competencies envisage confidence and critical appraisal in the use of Information and Communication Technology (ICT) to produce, research, process and exchange information at the workplace, in the public domain and in personal communication. Information and media competence, the fundamentals of programming, algorithmic thinking, working with databases, and skills in Internet security and cyber security. Understanding of the ethics in information processing (copyright, intellectual property, etc.)" (I.A. & M.S – underlined by us) [14, p. 12].

The National Standard treats each key competence through a range of crosscutting skills that are supposed to be developed across 10 education domains mentioned above. Specifically, the domain of information and digital competence aims at the personal growth of the learner who

is capable of using digital instruments and technologies in order to solve problems, to develop, to express themself creatively, to ensure personal and community wellbeing, to develop critical thinking and act safely and responsibly in a digital society [21]. Learning outcomes related to the ICT competence include an ability to perform a wide range of operations with data such as data search, data analysis, data transformation, data generalization, data categorization, and data presentation; to critically evaluate information in order to solve real-life problems; to create digital products and applications individually and in cooperation in order to solve problems and express oneself; to use information and communication technologies and digital instruments both as a creator and a user in order to get access to information, to communicate and cooperate with others; to master new technologies; to realise the impacts of digital technologies use on oneself, on society and on the environment; and meet ethical, cultural and legal standards for communication and information exchange.

Hence, the scope of ICT and digital competencies encompasses the following domains:

1) the ICT use;
2) information and media competence;
3) basic computational competences (i.e. "fundamentals of programming, algorithmic thinking, working with databases") and
4) fundamentals of digital citizenship (i.e. the issues connected with Internet security, cyber security, ethics in information processing, the impacts of ICT use and academic good practice).

Let us consider the elements of the ICT and digital competences in more detail.

ICT or information and communication technology/ies are defined as "a set of techniques and devices based on new technological tools and the different supports and channels of information and communication" [17]. In its simplified sense, the term ICT means any technology that is related to information and communication. According to Hilkemeijer, today the term implies the combination of tools that have to do both with information and communication the making them one thing [4] so that "the repertoire of technologies expands further to encompass computers and computer-related products, email, MMS, and other forms of communication" [15]. The most used technologies in education include blogs and social networks, planners or digital planning tools (calendars, task managers, etc.), cloud for data storage, and digital whiteboards an interactive tables, e-learning platforms, on-line assessment tools, etc.

Information and media competence is by itself a complex construct combining two elements: information competence and media competence.

Information competence, sometimes referred to as information literacy, includes skills related to two domains:

1) the access to and evaluation of information that imply the ability to access information efficiently in terms of time and effectively in terms of sources as well as evaluate information critically and competently; and

2) the use and management of information that imply using information creatively to solve the issue in question, managing information coming from a wide variety of sources and processing information incompliance with ethical and legal requirements [5].

Media competence encompasses two components: media analysis and the creation of media products.

Basic computational competences relate to the development of learners' skills in programming, algorithmic thinking, and working with databases. They serve as a basis for the development of learners' computational thinking which underlies problem-solving skills [8]. Jeannette Wing defines computational thinking as "a way of solving problems, designing systems, and understanding human behavior by drawing on the concepts of computer science." [18, p. 33]. Although the definition relates computational thinking to the domain of computer science, it can be transformed into an approach to solving challenging tasks and puzzles in all classes and across all disciplines at school. For example, Sheldon emphasizes that learners demonstrate elements of computational thinking, algorithmic thinking in particular, when they create or use a well-defined series of steps to achieve a desired outcome [12].

Fundamentals of digital citizenship embrace the issues connected with Internet security, cyber security, and ethics in information processing. Internet and cyber security relate to developing safe online behaviour practices. Internet security has become an important topic in the field of education since ICT tools and on-line teaching modes schooling incorporates today require learners to spend more time online, thus, making them susceptible to manipulation or intimidation. Hence, although ICT technology provides effective ways to enhance curriculum and language instruction, teachers need to take a part in the responsibility of teaching students how to use the technology safely [1, p. 52].

Encyclopedia.com describes ethical issues relating to information processing as "the ethical dilemmas involved in areas of information processing, including theories, approaches in decision-making situations, and methods of increasing awareness of ethics". More specifically, they are referred to two groups of issues: (1) unethical behaviour leading to immoral acts such as virus creation and software piracy and (2) lack of awareness about information technology security and information technology-related crimes [3]. Parker identifies two types of ethical problems

in the area of information processing: serious ethical problems that include an invasion of privacy, copyright issues, and computer fraud, on the one hand, and "little" problems of personal ethics, on the other [10, p. 198].

Model educational programs for foreign languages specify the ICT and digital competences with respect to two categories: Skills and Attitudes [22, p. 8]. In particular, skills include the ability to learn English by using applications, games, social networks, etc.; to create digital products in English; to communicate in English using ICT. The attitudinal component relates to the issues of authorship and information ethics.

Hence, the findings of the research into ICT in school education in Ukraine shows that its scope goes far beyond the application of ICT in EFL teaching and learning. Being one of the key competences of the New Ukrainian School, ICT and digital competences prove to be a complex construct that apart from the ICT use embraces such issues as information and media competence; basic computational competences and fundamentals of digital citizenship. Given most of the current teaching and learning is taken place online, each of these elements is of crucial importance.

The ICT competence plays an important role in the overall development of the 21st century learner. It is the competence that enables a learner to develop necessary skills to meet the ever-increasing demands of the 21st century learning and professional domains since it lays the ground for the learners' abilities "to monitor and manage their own learning, to think critically and creatively, solve simulated real-world problems, work collaboratively, engage in ethical decision-making, and adopt a global perspective towards issues and ideas" [11].

Baboval views ICT teacher's competence as a construct comprising four components: value-based and motivational; cognitive; operational and reflective [20, p. 8]. The value-based and motivational component refers to teacher's motives, goals, needs and values. The cognitive component involves teacher's skills to process information and work with information objects. The operational component implies the teacher's ability to use ICT in their professional teaching practices.

Based on Baboval's model of teacher's ICT competence, we may develop the learners' ICT competence model. Figure 1.1. shows the structure of the learners' ICT competence according to this model. Hence, ICT competence includes technological skills, information skills, information value and ethics awareness and motivation.

Technological skills are skills learners develop as a result of the use of the computer and technologies [19].

Information skills are the sets of skills and competencies required to find and use information, usually in a formal education context [6, p. 2116]. The term first appeared in the early 1980s in relation to school pupils'

competence to search for information by "using libraries, exploring references and making notes" [7, p. 7]. The current interpretation of information skills has gone far beyond learners' library skills to embrace a range of skills pupils need to effectively handle information. According to Markless, the Big Six Skills model is the most influential generic skills model in education field [6, p. 2117]. It comprises 6 elements:

1. Task definition implies identifying the purpose and need for information.
2. Information seeking strategies involve examining studying available resources and determining priorities.
3. Location and access mean locating sources and finding information within them.
4. Use of information implies extracting the needing information from the source.
5. Synthesis involves integrating and presenting information extracted from multiple sources.

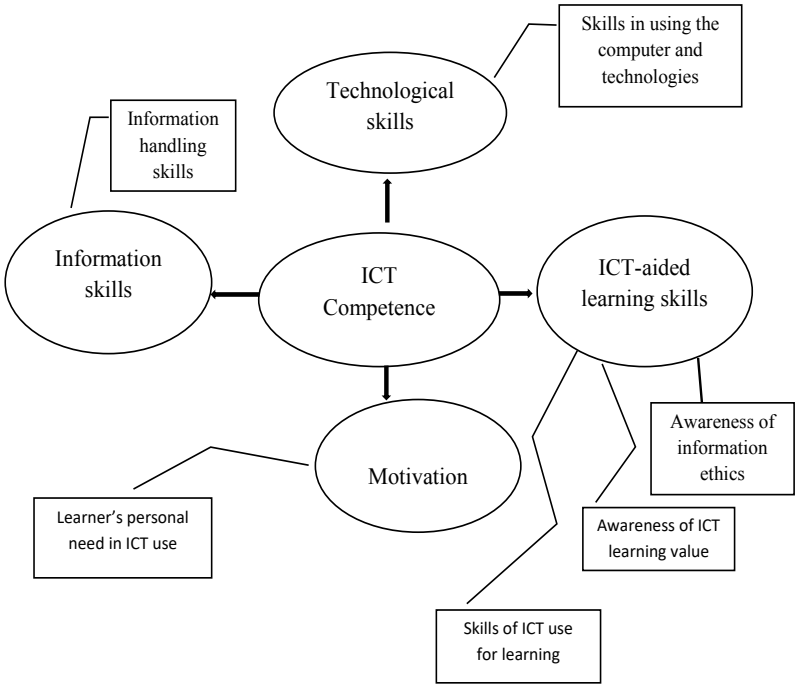

Figure 1. Structure of Learners' ICT Competence

6. Evaluation implies making judgements about both the final outcome in terms of its effectiveness and the information problem-solving process involved with regard to its efficacy.

Learners' ICT-aided learning skills comprise two components: learners' awareness of the role ICT has in learning English and their ability to use ICT for learning purposes. ICT has a profound impact on the way pupils are learning. This influence goes far beyond supporting and facilitating the content delivery in the classroom. Literature reveals that ICT is learner centric since it facilitates learners' active involvement in the learning process [13]. ICT contributes to the creation of independent learning environment in which learners find their own way of learning and take responsibility for their learning. ICT also provides learners with a range of tools, options and choices to optimize their learning experiences, thus, making them more effective. However, it is essential for learners to be aware of the benefits ICT provides for their EFL learning experience. Moreover, in spite of having a way with modern digital devices, 21st century learners prove to be incompetent in the use of ICT to support their knowledge construction. Hence, the ICT competence implies the development of learners' skills to use ICT to support their learning process.

The awareness of information ethics relates to the concept of digital citizenship. It implies the responsible use of information and communication technologies. However, teaching digital citizenship goes beyond mere following of rules and regulations. Its learning outcomes involve the learners' development of critical thinking, and ensuring their safe behaviour, responsible practices and maintaining health and wellness in the digital world [2].

The motivation component in the structure of ICT competence refers to the learners' personal needs to use ICT in their learning.

Conclusions. Hence, the scope of ICT and digital competences implies learners' competences that go beyond the use of ICT. Being one of the key competences of the New Ukrainian School, ICT and digital competences are viewed as a complex construct that embraces the ICT use, information and media competence; basic computational competences and fundamentals of digital citizenship. Learners' ICT competence embraces a body of knowledge, skills and attitudes that learners need in order to handle information effectively to learn throughout life and grow personally.

REFERENCES

1. DeFranco J. F. Teaching Internet Security, Safety in Our Classrooms. *Techniques: Connecting Education and Careers (J1)*. 2011. V 86, No 5. P. 52–55. URL: https://eric.ed.gov/?id=EJ925444 (accessed: 01.08.2022).
2. Digital Citizenship and Ethics. *Let's talk science*. *Backgrounders.* October 05, 2020. URL: https://letstalkscience.ca/educational-resources/backgrounders/digital-citizenship-ethics (accessed: 02.08.2022).

3. Ethics in Information Processing. *Encyclopedia.com*. URL: https://www.encyclopedia.com/finance/finance-and-accounting-magazines/ethics-information-processing (accessed: 01.08.2022).
4. Hilkemeijer M. Why schools should invest in ICT. *ICTE solutions Australia*. November 2021. URL: https://www.ictesolutions.com.au/blog/why-schools-should-invest-in-ict/ (accessed: 01.08.2022).
5. Information, media and technology skills. *Career Pathways.* Bellevue College. URL: https://www2.bellevuecollege.edu/careerpath/IT_skills.html (accessed: 11.08.2022).
6. Markless Sh. Reconceptualising Information Literacy for the Web 2.0 Environment? *Handbook of Research on Social Software and Developing Community Ontologies*. 2009. P. 2115–2133. DOI: 10.4018/978-1-60566-208-4.ch022 (accessed: 09.08.2022).
7. Marland M. Information Skills in the Secondary Curriculum. *Schools Council Bulletin 9*. London : Methuen Educational, 1981. URL: https://scholar.google.com/scholar_lookup?hl=en&publication_year=1981&author=+M.+Marland&title=Information+Skills+in+the+Secondary+Curriculum (accessed: 01.08.2022)
8. McVeigh-Murphy A. Four Examples of Computational Thinking in the Classroom. *Learning Equip*: *Powering digital learning experiences*. September 2019. URL: https://equip.learning.com/examples-of-computational-thinking (accessed: 01.08.2022).
9. Nychkalo N. "New Ukrainian School": the Present and the View to the Future. *LABOR et EDUCATIO*. 2017. Nr 5, P. 89-106. DOI: 10.4467/25439561LE.17.005.7980 (accessed: 04.08.2022).
10. Parker D. B. Rules of Ethics in Information processing. Communications of ACM. 1968. Vol 11. No 3, P. 168–201. URL: https://dl.acm.org/doi/pdf/10.1145/362929.362987 (accessed: 01.08.2022).
11. Ra S. 5 Ways to Use ICT to Address Education Challenges. *Asian Development Blog*. URL: https://blogs.adb.org/blog/5-ways-use-ict-address-education-challenges (accessed: 01.08.2022).
12. Sheldon E. Computational Thinking Across the Curriculum. *Edutopia. STEM*. March, 2017. URL: https://www.edutopia.org/blog/computational-thinking-across-the-curriculum-eli-sheldon (accessed: 01.08.2022).
13. Teaching and learning with ICT tools: Issues and Challenges. *Digital Learning*. October 2020. URL: https://digitallearning.eletsonline.com/2020/10/teaching-and-learning-with-ict-tools-issues-and-challenges/ (accessed: 05.08.2022).
14. The New Ukrainian School. Conceptual principles of secondary School Reform. Ministry of Education and Science of Ukraine. 2016. 40 p. URL: http://mon.gov.ua/Новини%202016/08/21/2016-08-17-3-.pdf (accessed: 01.08.2022).
15. Transforming Learning with ICT : Making IT Happen / Finger G. et al. Sydney, Australia : Pearson, 2007. 333 p. United Nations Ukraine 2018-2022 Partnership Framework. 2018 Progress report. 32 p. URL: https://ukraine.un.org/sites/default/files/2020-06/One%20UN%20Report%202018%20Final.pdf (accessed: 01.08.2022).
16. What are the uses of ICT in education? *Pedaggoo*. 28.06.2020. URL: https://pedagoo.com/uses-of-ict-in-education/?lang=en (accessed: 01.08.2022).
17. Wing J. M. Computational thinking. *Communications of the ACM.* March 2006. Vol. 49. No 3. P. 33–35. URL: https://www.cs.cmu.edu/~15110-s13/Wing06-ct.pdf (accessed: 01.08.2022).

18. Zhou M. Y. Learning Management Technology and Preservice Teachers. *Encyclopedia of Information Science and Technology*, Third Edition. 2015. 9 p. DOI: 10.4018/978-1-4666-5888-2.ch247 (accessed: 01.08.2022).
19. Бабовал Н. Формування цифрової компетентності педагога в умовах Нової української школи. *Цифрова компетентність сучасного вчителя нової української школи: зб.тез доповідей учасників всеукр.наук.-практ.семінару* (Київ, 12 березня 2019 р.) / за заг. ред., О.В. Овчарук. Київ : Інститут інформаційних технологій і засобів навчання НАПН України. Київ, 2019. С. 8–10. URL: https://lib.iitta.gov.ua/715564 (accessed: 01.08.2022).
20. Державний стандарт базової середньої освіти. 5-9 класи Нової української школи. Міністерство освіти і науки України. Постанова від 30 вересня 2020 р. № 898. URL: https://www.kmu.gov.ua/npas/pro-deyaki-pitannya-derzhavnih-standartiv-povnoyi-zagalnoyi-serednoyi-osviti-i300920-898 (accessed: 01.08.2022).
21. Модельна навчальна програма «Іноземна мова. 5-9 класи» для закладів загальної середньої освіти (авт. Редько ВГ., Шаленко О. П., Сотникова С.І., Коваленко О.Я., Коропецька І.Б., Якоб О.М., Самойлюкевич І.В., Добра О.М., Кіор Т.М.). URL: https://imzo.gov.ua/model-ni-navchal-ni-prohramy/movno-literaturna-osvitnia-haluz/inozemna-mova/ (accessed: 01.08.2022).
22. Модельна навчальна програма «Іноземна мова. 5-9 класи» для закладів загальної середньої освіти (авт. Зимомря І.М., Мойсюк В.А, Тріфан М.С., Унгурян І.К., Яковчук М.В.). URL: https://imzo.gov.ua/model-ni-navchal-ni-prohramy/movno-literaturna-osvitnia-haluz/inozemna-mova/ (accessed: 01.08.2022).