



SELFIE AS A TOOL FOR MEASURING THE DIGITAL COMPETENCE OF PARTICIPANTS IN THE EDUCATIONAL PROCESS

Natalia Morze¹, Liudmyla Chernikova², & Viktoriia Kucherovska³

^{1,3} Borys Grinchenko Kyiv University,

04053, Kyiv, Ukraine, 18/2, Bulvarno-Kudriavska Str.

² Municipal institution “Zaporizhsky Regional Institute of Postgraduate Pedagogical Education” of the Zaporizhzhia Regional Council, 69035, Zaporizhzhia, Ukraine, 57-A, Nezaleznoi Ukrainy Str.

¹ n.morze@kubg.edu.ua, ORCID 0000-0003-3477-9254

² tchernikova.la@gmail.com, ORCID 0000-0002-1214-9019

³ v.kucherovska.asp@kubg.edu.ua, ORCID 0000-0002-4064-9416

Abstract: *There are different approaches to the assessment of the level of digital competence of the population and, in particular, participants of the educational process. Digital competence is considered one of the key competences of every citizen of a modern digital society, which is why the task of developing it to a measurable level is relevant for all educational institutions.*

The article investigates the results of the pilot implementation of the SELFIE tool developed by the EU in secondary education in Ukraine. The indicators of key areas of SELFIE, the level of confidence in the use of technology by respondents, as well as the positive and negative experiences of survey participants in the implementation of digitalisation in the educational process are studied. Proposals for the future development of the project SELFIE in educational institutions of Ukraine are described. The research uses such methods as analysis of scientific works to interpret key concepts, systematization of information on the use of digital technologies in education, directions of digitalisation of education, explanation of the current state of digital transformation of education and analysis of the results of the SELFIE pilot project survey of participants in Ukraine.

The conclusions describe the possibility of increasing the efficiency of measuring digital competence using SELFIE.

Keywords: digitalisation, digital competence, educational strategies, digitalisation of education, SELFIE tool, digital skills.

INTRODUCTION

According to McKinsey (Blackburn, LaBerge, & O'Toole, 2020), our world made a 5-year leap just in eight weeks of 2020 in the implementation of digital, consumer and business solutions. Digitalisation has suddenly become an integral part of everyone's life. The all too rapid transition to online learning has, on the one hand, contributed to the renewal and emergence of new progressive and interactive learning practices. On the other hand, however, it has created additional challenges for the organization of the educational process under the new conditions. Online learning had showed that teachers and educational leaders have lack competence and confidence in the effective use of digital technologies, especially online. The painful transition to the new digital realities is primarily a consequence of the insufficient level of digital competence not only of educators, but also of society as a whole. For example, Deputy Minister of Digital Transformation for European Integration Valeriia Ionan (Ionan, 2021), mentioned in her reports that in the spring of 2020, 79% of managers of Ukrainian general secondary education institutions (GSEIs) organized additional training for teaching staff to improve the quality of distance learning in quarantine. For the digital transformation of the educational process, the main obstacle to success is the lack of understanding where to start and foreseeing the prospect of this process. Since the prospect of massive change can be difficult, it is important to understand in which direction to move or how to form a solid strategy. Building strategies for the digital development of an educational institution is only possible if one understands the level of readiness for change and the level of training of all participants in the educational process. This can be ensured through surveys and tests to determine the level of digital competence.

In this study, we consider SELFIE as a tool for measuring the digital competence of participants of the educational process, which can be offered to secondary education institutions to form a strategy for effective technology implementation.

According to the glossary of the Digital Competence Framework for Ukrainian Citizens (DigComp, 2021), digital competence is an integral personality trait that dynamically combines knowledge, skills, abilities and attitudes regarding the use of digital technologies for communication, personal development, learning, work, participation in public life, in accordance with the field of competence, in an appropriate manner (safely, creatively, critically, responsibly, ethically). Ocaña-Fernández, Valenzuela-Fernández, and Garro-Aburto, (2019) consider digital competence as a holistic picture that encompasses technological knowledge and abilities that should be developed in an integrated way. Marzal García-Quismondo & Cruz-Palacios believe that digital competence in the education of citizens will provide prospects of empowerment regarding internal social aspects such as politics, economics, employment, etc. as well as aspects of new cultural trends and entertainment of this century (Marzal García-Quismondo & Cruz-Palacios, 2018).

Nonetheless, Iordache, Mariën, and Baelden, (2017) insist that digital competence is considered to be the most practical and measurable outcome of learning processes for the new digital literacy.

Digital competence is not just the ability to read and write emails online. It is the ability to work with information, process it, apply critical thinking skills to assess the reliability of information and create new content and spread it.

FORMULATION OF THE PROBLEM

Today we are witnessing the mass distribution of digital technologies nowadays. Digital technologies accelerate economic growth and the efficiency of technological processes, contribute to productivity growth and, as a result, improve the quality of services, and also expand opportunities in education. However, the benefits of digital innovation largely depend on the technical equipment of the population, internet connectivity and level of digital skills.

The impetus for the increased pace of digitalisation was the COVID-19 pandemic and the forced displacement of people due to the war. The pandemic crisis and the war in Ukraine accelerated the transformation processes that caused many changes in all aspects of life, including education, and led to new challenges for educational authorities at both local and national levels. Technological acceleration has opened the problem of unpreparedness of citizens for the drastic changes associated with digital transformation and, at the same time, preparedness of teaching staff to improve the quality of online studying during the quarantine. This situation was created in most enterprises of all sizes. Employees of different professions suddenly found themselves in personal crises. The whole world was forced to urgently master services for network communication and interaction, switch to electronic document management and learn online communication.

According to a study of the digital literacy of the Ukrainian society in 2021 (Dig-SkillsUkraine, 2021), 47.8% of the citizens had knowledge of digital skills below the basic level, 52% of the survey participants said that they had tried online tools for the first time since the COVID-19 pandemic, the most common of which are online shopping apps, online news tracking and remote work. At the same time, 44.4% of respondents are interested in improving their digital skills.

According to the results of a survey KPMG (Tsymbal, 2020), 42% of Ukrainian CEOs and 69% of CEOs globally plan to reduce office space and introduce remote work for some employees and to hasten the end of the pandemic.

The obstacles to the digitalisation of the population are quite primitive: laziness, fear, self-confidence and, most importantly, lack of understanding of what digital competence is, what digital skills one should have, how to measure its level and how to protect oneself from cyber fraud.

Avast (Avast Academy Team, 2022) together with YouGov and Forsa conducted a survey in 2021. They surveyed 16 thousands users of the internet in 17 countries to learn digital citizenship trends around the world. The results of that survey showed that:

- 4.6 billion people (more than half of the world's population) have access to the Internet;
- about 700,000 people access the Internet every day;
- 60% of respondents worldwide said that the Internet has become more important in their lives because of the global pandemic;

- 30% of respondents said they have continued their professional activities online because they are already used to it;
- older generations are generally unable to learn to use technology as quickly and easily as they would like;
- although the younger generation who grew up with these technologies can easily use them, they often need additional support in understanding digital activities;
- digitalisation of all spheres of public life is a topical issue not only because of the pandemic and war in Ukraine, but also because of global trends and national policy on the vector of digital transformation of the country.

Objective: to outline the concept of digital competence, to show the possibility of increasing the efficiency of measuring digital competence using SELFIE.

RESEARCH METHODS

The research uses such methods as analysis of scientific works to interpret key concepts, systematisation of information on the use of digital technologies in education, directions of digitalisation of education, explanation of the current state of digital transformation of education and analysis of the results of the SELFIE pilot project survey (JRC & ETF, 2021).

LITERATURE REVIEW

Viberg, Mavroudi, Khalil, Bälter (2020) built a seven-factor structure of digital competence of teachers with emphasis on their readiness for digitalisation: ability to use digital learning technologies; social influence and support; intention to use; usefulness and effectiveness; awareness of limitations; pedagogical potential; awareness of assistance.

Nikou, De Reuver, Kanafi, proposed a conceptual model of information and digital literacy as a new prerequisite of the technology acceptance model. The authors insist that the role of digital literacy of employees is neglected in the modern literature (Nikou, De Reuver, & Mahboob Kanafi, 2022).

Park, Kim, & Park, write that digital literacy is a multidisciplinary field that broadly covers literacy, ICT, Internet, computer skills, science, health and language education (Park, Kim, & Park, 2020).

Our national scientists are also studying the importance of digital competence for improving the economy and the quality of services. Bykov believes that the digitalisation of society reflects the trends of the scientific and technological progress (Bykov, 2017). Thus, digital transformations allow us to ensure the mobility of users' activities in information spaces; to develop cloud technologies; to process large amounts of data in order to make informed decisions; to promote the development of the nation and electronic communications systems; to promote greater attention to data protection systems; to develop the digital services market, etc. Litvinova defines the digital transformation of the educational process as filling the educational environment with devices for learning and teaching, cloud-oriented technologies and technologies of augmented and virtual reality (Lytvynova, 2019).

Sukhonos, Garust, & Shevtsov, studied foreign experience and prospects for its implementation in the Ukrainian education system. The authors believe that the success of digitalisation of education depends on the level of state support, which entails the need to create a state programme (mechanism) of digitalisation of education (Sukhonos, Harust, & Shevtsov, 2019).

DIGITAL LITERACY OF THE POPULATION AS A NECESSARY SKILL FOR LIFE

The development of cities and their digitalisation is a multidimensional process. However, in most cases, this process focuses on the development of new technical solutions. Governments often do not pay necessary attention to human resource development. Instead, technologies generate new innovative solutions, but they are only tools, access to which is limited due to the lack of digital skills. As we live in the era of digital development, the task of local leaders is to promote the development of digital competence of citizens. We should strive for every single citizen to have the opportunity to acquire digital skills in the short and long term. In a world where technology is spreading very fast, digital competence is becoming necessary and there is no alternative to it. Cities and regions that fail to re-skill their workforce will not be able to compete globally, as they will experience a sharp economic decline. Digital transformation is taking place in almost all spheres of human life, not leaving aside the education system. One of the key tasks of today is to ensure the digital transformation of educational institutions that will meet the requirements and opportunities, integrate with the global information open educational space, which provides free access for all participants to world digital resources, meet the educational needs of students, as well as effective interpersonal e-communication and e-collaboration.

Nowadays, educational strategies require radical changes, rethinking and comprehensive attention. Only if the right vision of digital skills is formed at the local level, it is possible to provide quality educational services that meet the requirements and challenges of digital transformation in the world. This means that an important role on the way to reformatting educational environments is played by the right content and quality curriculum for students, which will allow them to receive education remotely. Education should be considered as something that starts from childhood and has no limits, that is, it lasts throughout life.

STANDARDS FOR TEACHING AND ASSESSING DIGITAL COMPETENCES. POLICY OF THE DIGITALISATION OF EDUCATION IN UKRAINE

In order to bridge the digital divide in Ukraine, the Digital Competence Framework for Ukrainian Citizens (DigComp, 2021) was developed by the Ministry of Digital Transformation with the support of the EU4Digital initiative. The framework will serve as a so-called digital competence standard for Ukrainians and will be used to

improve the level of digital competences. It outlines the scope of knowledge, skills and practical abilities that citizens need to compete in the Ukrainian and European labour markets and to comfortably use modern digital technologies. The framework is the basis for creating state policy and planning further educational initiatives. The Ukrainian DigComp is based on the European Digital Competence Framework (Carretero Gomez, Vuorikari, & Punie, 2017), which was adapted to the national, cultural, educational and economic peculiarities of Ukraine.

One of the tasks of implementing DigComp is to make additions and changes to professional standards and job requirements, as well as to create educational programmes, training courses, educational resources, with the subsequent creation of a professional detailed Framework for improving the level of service provision.

Today, the current documents are the Professional Standard of a Teacher of a General Secondary Education Institution (ProfStandardTeacher, 2020) and the Professional Standard of a Head (Principal) (ProfStandardHead, 2021) of a General Secondary Education Institution. These documents are aimed at helping participants in the educational process to determine clear guidelines for their own professional development, in particular to develop information and digital competence. The Ministry of Digital Transformation of Ukraine, together with the Ministry of Education and Science of Ukraine, has developed a draft “Conceptual and Reference Framework for the Digital Competence of Pedagogical and Scientific and Pedagogical Workers” (DigCompEdu, 2021). It is based on the European model of the EU Digital Competence Framework for Educators (Redecker & Punie, European Framework for the Digital Competence of Educators: DigCompEdu, 2017). Thanks to the implementation of the Framework, it is possible to design individual educational trajectories for students. According to the approach described in the Framework, the teacher becomes a leader in the digital world, not a “library of knowledge”, as it was before. This, accordingly, becomes an impetus to increase the level of personal competences of teachers and managers of educational institutions.

The Concept of Digital Transformation in Education (Concept, 2021) is currently being approved. This document was created to promote the development of education, namely:

- pay attention to the development of digital infrastructure;
- create opportunities for the development of digital skills of teachers and students;
- implementation of registers for automation of educational processes.

The use of the recommendations of the Concept will make it possible to narrow the gap of digital competences of participants in the educational process, update the outdated content of education in academic subjects, solve the problem of lack of computer equipment and quality Internet coverage in institutions and institutions of the education and science system, and promote the creation of high-quality digital educational content.

The strategic goals of the Concept implementation are:

1. To make the digital educational environment accessible and modern.
2. To form digital competences in education workers.
3. Update the content of ICT education to meet modern requirements.

4. Ensure transparency of services and processes in the field of education and science. Make them convenient and efficient.
5. Study and research the state of digital transformation of education and science. The implementation of this plan should take place by 2026.

PILOT IMPLEMENTATION OF SELFIE

General information

As part of the implementation (JRC & ETF, 2021) of the course of nationwide digitalisation in Ukraine in 2021, a pilot implementation of the free online resource SELFIE was carried out, which aims to help educational institutions analyse the state and effectiveness of the use of digital technologies in the educational process. This resource is a tool that allows you to form an idea of the current state of the level of digitalisation of the educational institution and further develop a strategic action plan to improve performance. The piloting of the SELFIE tool in Ukraine was conducted to determine the effectiveness of the use of digital technologies by educational institutions and to encourage further development of the digital potential of participants of the educational process. Analysis of the results of the SELFIE pilot project makes it possible to determine whether this tool meets the needs of Ukrainian reforms and the goals of digital transformation of the economy and education.

Organization of the pilot project

The piloting of the SELFIE project was initiated by the EU and the Ministry of Education and Science of Ukraine with the active support of the Ministry of Digital Transformation, implemented in 2021. For the pilot implementation, 63 secondary schools were involved in two regions – Lviv and Zaporizhzhia regions.

When choosing institutions, the organizers also took into account such criteria as the location of the institution, the number of students, the form of ownership of the institution. Experimental institutions of the New Ukrainian School also took part. All institutions that participated in the piloting of the project were selected on a voluntary basis.

For secondary schools, all piloting coordination was carried out by two SELFIE regional coordinators. Their main role was to organize the piloting process of the SELFIE project.

An important stage in the preparation of the pilot was the task of adapting the tool to the Ukrainian education system. After the preparation of the question bank, a technical check of the instrument was carried out, followed by recommendations for changes in the questionnaire. The overall preparation process lasted 7 months.

Implementation

For the pilot educational institutions of the project, the implementation of SELFIE took place in the following stages:

- registration and adaptation of the tool to the respondent institution;
- conducting a survey of participants in the educational process;

- receiving the SELFIE report, which is generated automatically on the platform;
- analysis of the results and their discussion in the teaching staff;
- development of a plan to improve the results;
- development of a digitalisation plan for the surveyed educational institution.

Interest in the survey was due to the opportunity to obtain an objective comprehensive assessment of the state of digitalization, which can be used for further development of the institution. The total number of pilot participants in secondary education institutions reached 12714 people (Figure 1).

Table 1. Participants of the pilot implementation of SELFIE in Ukraine

SELFIE	Participants	Supervisors	Teachers	Students
Quantity, person	12 714	368	1899	10 447
%	100	2,9	14,9	82,2

Source: Own work.

Analysis and conclusions

Key indicators in eight key areas of SELFIE (Figure 1):

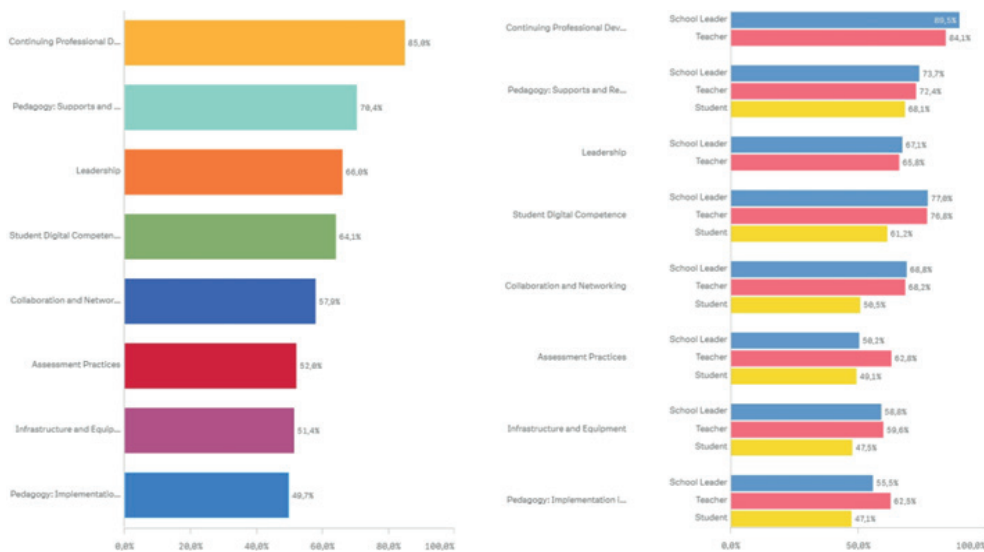


Figure 1. Overview by area. Percentage of positive responses by area

Source: SELFIE tool report.

According to the survey results, we can observe a fairly high level of measurement in the area of Continuing Professional Development in the introduction of digital technologies (85%). This indicator is expected, because during the pandemic, most teachers were required to receive training in digital skills. The result of Pedagogy:

Support and Resources (70.4%) is also predictable, as educational tools are now an integral part of the educational process. Leadership (66.0%) needs attention, this percentage can be caused by a misunderstanding of the meaning of the term and inability to develop leadership skills in students. Students' Digital Competences (64.1%) – the formation of students' digital competences of students should be cross-curricular, in turn, computer science programmes should be revised and updated. Slightly worse results were demonstrated in the questions related to Pedagogy: Implementation in classroom (49.7%) – traditional teaching methods still prevail in classrooms, even during distance learning, teachers do not often use multimedia and interactive resources. Infrastructure and Equipment (51.4%), the obstacles are insufficient funding to update computer classes and the general infrastructure of the institution, inability and/or unwillingness to use certain technologies. Assessment Practices (52.0%) need to be diversified, the system of student assessment should be revised to assess not only knowledge but also skills and abilities. Collaboration and networking (57.9%) is an indicator that, in the context of distance learning, needs to be rapidly increased, this can be achieved by creating a dialogue between educational institutions to identify common problems faced by institutions for further joint solutions. Thus, all these indicators require attention and refinement (Figure 2).



Figure 2. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

Every member of the teaching staff of a general secondary education institution in Ukraine is obliged to acquire new and improve previously acquired competences within their professional activity or field of knowledge, so the indicator of 88.2% is expected. Teachers can choose their own areas of professional development and, accordingly, through motivation, it is possible to increase the level of readiness.

The study of general data indicators shows that working with online educational resources is provided at a fairly high level in Ukraine (87.5%), experience sharing between colleagues is common (83.5%), and open educational resources are used (82.3%). The need for continuing professional development is felt by 83.2% of respondents, these data may be due to the overload of teachers (Figure 3).

Most teachers (79.5%) indicated that they have the opportunity to discuss their thoughts and issues with school leaders who support new ways of learning (77.7%). Participants in the educational process at a sufficient level (77.5%) have knowledge about the safe use of digital resources, adhere to the principles of academic integrity (72.4%) and devote time to studying the progress of their activities (70%) (Figure 4).

Another important indicator is access to the Internet (69.6%). The school should have a local network with access to the Internet from all available computers with the ability to filter out harmful content and access to wireless Internet.

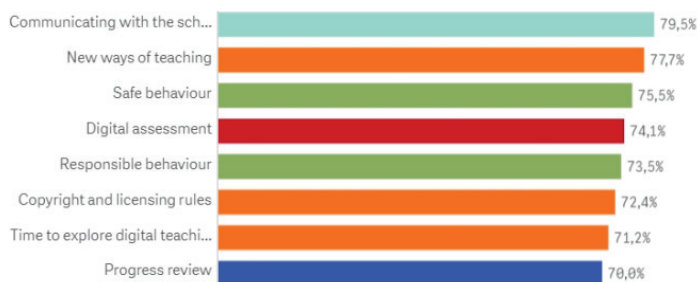


Figure 3. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

According to the results, attention should be paid to measuring and preventing the digital divide (67.6%). Readiness to use the virtual digital environment (67.1%) and the use of data to improve learning is at a fairly good level (64.6%), which may also be a consequence of the conditions in which learning and teaching currently take place.



Figure 4. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

In contrast, the indicator of checking the quality of information (64.1%) should be further studied and requires significant attention. Addressing the previous needs will help to reduce the digital divide in institutions (Figure 5).

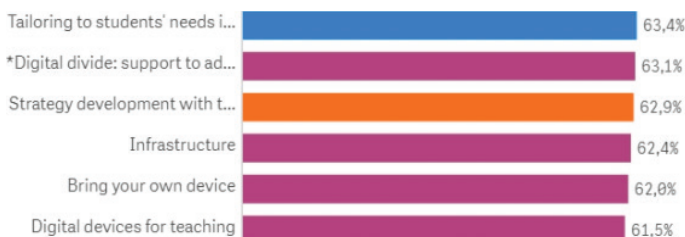


Figure 5. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

Teachers often use existing teaching tools, but these do not always meet the needs of individual students, some visual, some auditory, etc. It is therefore important to adapt the tools to the needs of students (63.4%).

Slightly more than half of the institutions (62.9%) pay attention to the development of a digital strategy. This indicator should be improved by conducting master classes and creating working groups to produce changes. At the same time, schools are not ready for updated learning technologies (62%) (for example, 1:1 eLearning, Blended learning, Flipped classroom, BYOD, etc.) (Figure 6).



Figure 6. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

Learning to communicate online and offline should be cross-curricular for all subjects (60.6%). Recommendations on the assessment of acquired competences should be added to the legislative documents, as currently only 59.2% of the surveyed participants of the educational process have an understanding of how to do this.

The basics of data protection and cybersecurity should become the basis of the new computer science programme (currently 58.8%).

Building partnerships among colleagues and leaders is the key to a quality organization of the educational process. Under such conditions, strong interdisciplinary ties, collaborative problem solving, creating an effective educational environment, etc. are possible. Therefore, the indicator of 58.8% needs to be improved.

Creativity as a skill plays a significant role in personality development, so teacher creativity will encourage children's learning, spark interest and stimulate new aspirations (56.6%). Digital content development has such a result (56.5%) due to the significant number of alternative solutions already created (Figure 7).



Figure 7. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

The place where education takes place can both inspire and depress. Building a quality educational space should be part of the institution's strategic plans (56.1%). Discussing technologies, sharing experiences helps to broaden opportunities and find like-minded people (55.7%). Only half of the respondents (55%) are interested in feedback from other participants in the educational process. This is a small percentage and needs to be carefully refined (Figure 8).

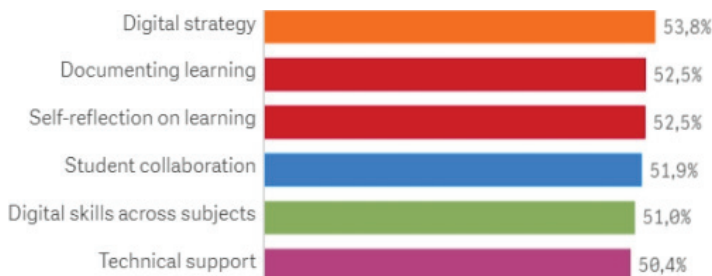


Figure 8. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

Having a vision for how an organisation uses digital learning in all its forms can be considered a digital learning strategy, and should be based on collaboration, the pursuit of immersive experiences and the use of diverse resources. There is a need to approve digital strategies both at the national and local level (53.8%).

Self-reflection is extremely important for each participant in the educational process, because it is through self-knowledge, self-analysis, self-assessment and self-control that the level of acquired knowledge, skills and abilities can be assessed.

We often do not even perceive important things in everyday life as something really valuable. Thus, we pay little attention to cooperation in educational institutions (51.9%). According to the results of the PISA-2018 testing and questioning of Ukrainian teenagers PISA-2018 (Mazorchuk, Tereshchenko, & Bychko, 2020), it is proven that higher results in reading are achieved by those students who consider cooperation as a value and are inclined to interact cooperatively with their classmates.

The value of students' cooperation for achieving higher results in learning, confirmed by objective evidence, should naturally encourage domestic educators to intensify activities that would help students to form sustainable skills of teamwork, purposeful collective interaction (even in conditions of remote, i.e. distance learning). As for technical support (50.4%), schools need full-time staff to monitor and provide technical support for hardware and software. Now it is mostly the responsibility of an IT teacher, voluntary wish of children or parents (Figure 9).

Most Ukrainian secondary schools have a policy of prohibiting the use of gadgets in the classroom (48.0%). Instead, students' own devices can be useful and extend the teacher's teaching and learning opportunities.

Teachers, like students, need recognition for their digital achievements. According to the survey, only 47.0% of respondents pay attention to this. This is a small percentage to motivate learners to new aspirations in this area.

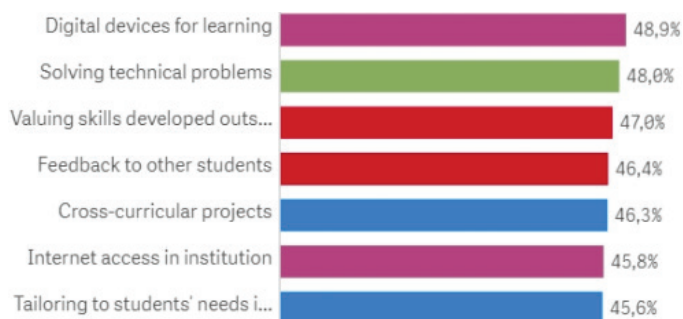


Figure 9. Question ranking. Percentage of positive responses

Source: SELFIE tool report.

Feedback between students is generated during collaborative activities (46.4%). It is important for teachers to pay attention to the correct formation of the ability to evaluate the actions of others, avoiding judgemental opinions and personal comments.

Cross-curricular links contribute to the activation of students' cognitive activity, improving the quality of knowledge, skills and abilities. Implementation of interdisciplinary links allows economical and at the same time intensive use of time at lessons (46.3%).

Regular surveys of students about their needs, desires, level of satisfaction with the organization of the learning process will help to understand the further trajectories of the institution. The results obtained can be used to build strategies for the digitalisation of the institution.

The SELFIE survey assessed teachers' attitudes to continuing professional development, which took place last year. Thus,, online professional learning was the most convenient for the majority of teachers – 87.1%. The most convenient ways for teachers to improve their qualifications were training through cooperation (83.0%), internal training (78.5%), and face-to-face professional training (78.3%). The least convenient for teachers was the way of in-service training through study visits – 58.5%. The level of confidence in using technology is: (Figure 10):

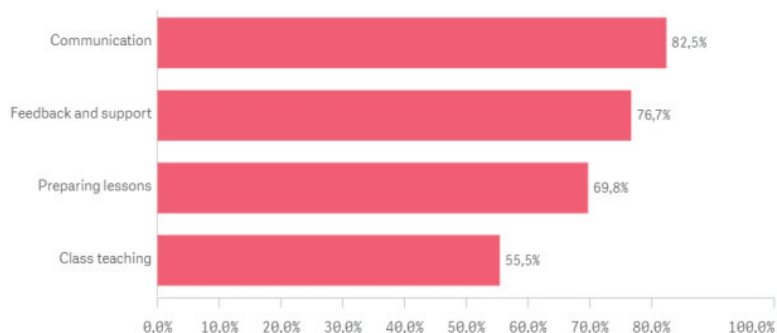


Figure 10. How confident do your teachers feel in using technology for the following tasks? Percentage of positive responses

Source: SELFIE tool report.

Thus, for most teachers, communication via the Internet no longer causes fear (82.5%), they are ready to receive feedback and support (76.6%). For a significant part of students, preparation for lessons has moved to the digital world from paper notes and outdated methods (69.8%). However, the organization of distance learning remains difficult for almost half of the respondents (44.5%).

Under conditions of nationwide quarantine and limited access to education, teachers used technology for teaching in 60.3% of their teaching time.

For teachers and managers, the use of technology is described as an accepting approach, with managers at 57.6% and teachers at only 34.3%.

Teachers and managers indicated factors that negatively affect teaching and learning with digital technologies (Figure 11):

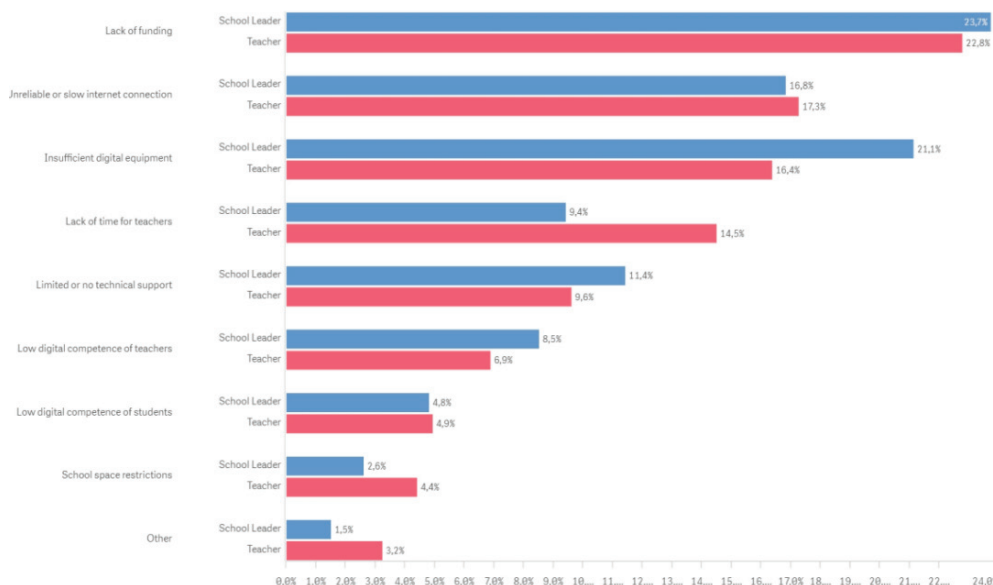


Figure 11. Is teaching and learning with digital technologies in your school negatively affected by the following factors? Percentage of each response option by user profile

Source: SELFIE tool report.

Factors that negatively affect distance learning according to teachers and managers (Figure 12).

Factors that positively influence distance learning according to teachers and managers (Figure 13).

One of the sections of the survey was to determine the conditions of technology use by students outside of school. Thus, 87.8% of respondents use technology for entertainment at home, 82.4% for studying and 45.7% of students do not use technology outside of school at all.

75.7% of the students surveyed have access to digital devices at home.

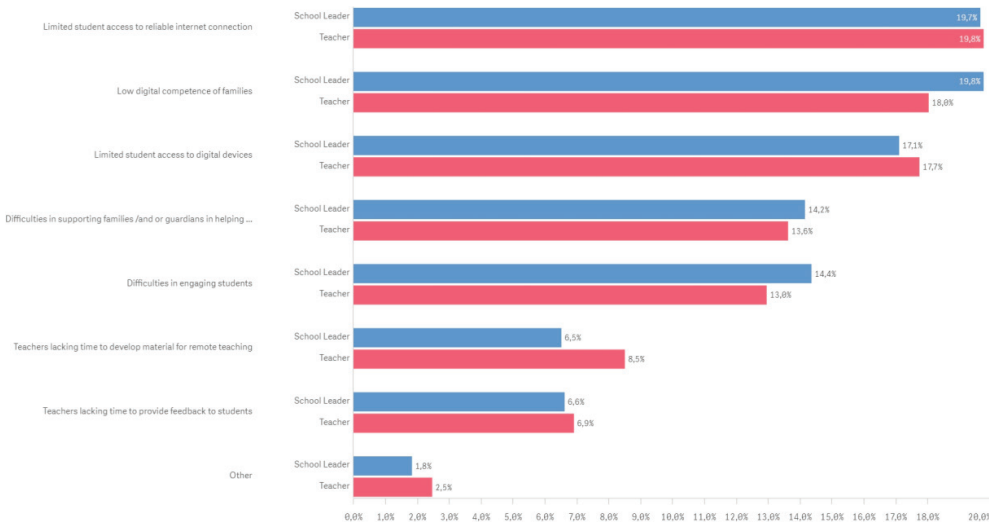


Figure 12. Is remote teaching and learning with digital technologies, negatively affected by the following factors? Percentage of each response option by user profile

Source: SELFIE tool report.

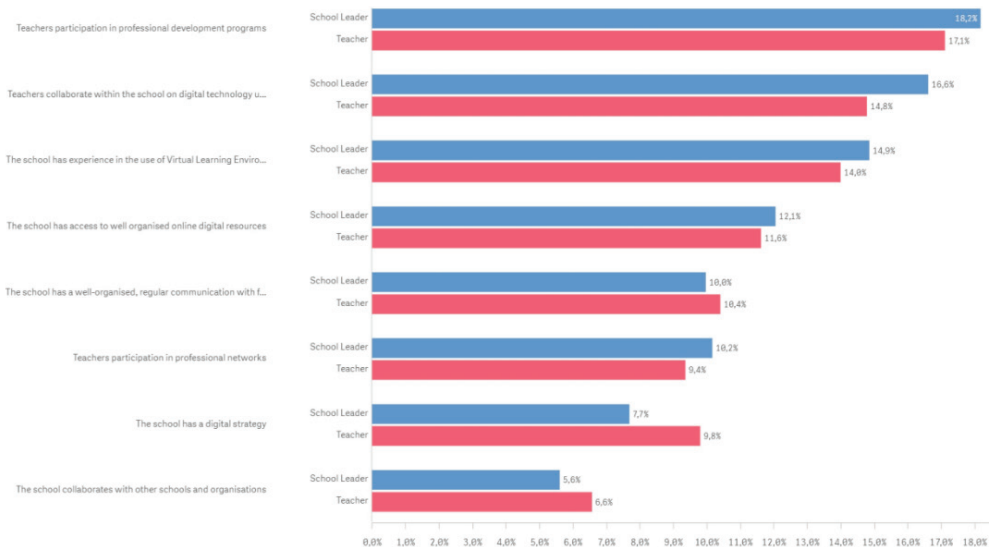


Figure 13. Is remote teaching and learning with digital technologies, positively affected by the following factors? Percentage of each response option by user profile

Source: SELFIE tool report.

Students’ responses to the question on positive factors influencing distance learning with the use of digital technologies (Figure 14):

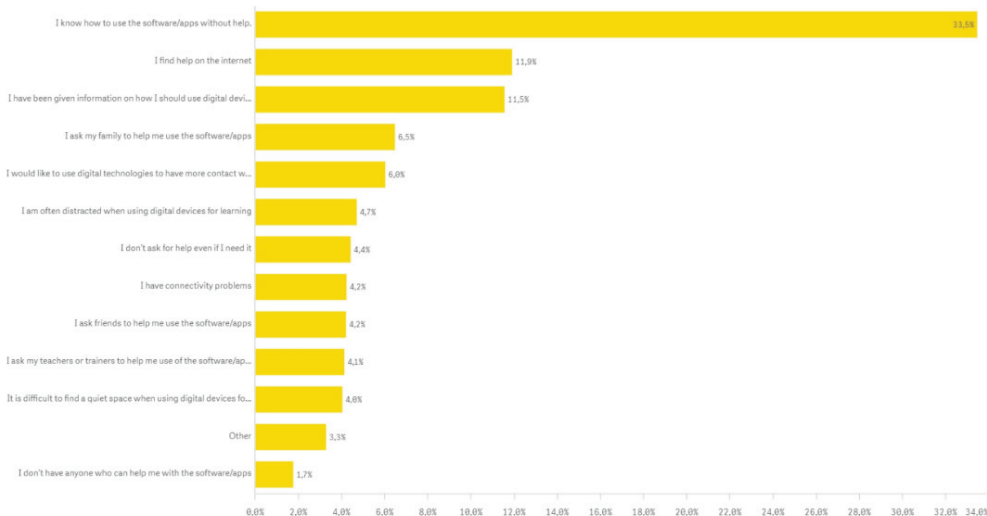


Figure 14. Is remote training with digital technologies positively affected by the following factors? Percentage of each response option by user profile

Source: SELFIE tool report.

SUGGESTIONS FOR THE FUTURE DEVELOPMENT OF THE PROJECT IN UKRAINE

In our opinion, parents are integral participants in the educational process, and their involvement in the survey will contribute to a comprehensive impact on increasing the level of digital potential of end users of educational services – students.

The survey should be conducted at school with the support of the SELFIE school coordinator (European Commission). Coverage of the results to ensure transparency and dissemination of the developed change strategy. The organization before the survey and the survey itself is not difficult. There are structured step-by-step SELFIE instructions and a SELFIE manual for school coordinators translated into Ukrainian. It is recommended to create a network of educational institutions using SELFIE in Ukraine to share best practices, as well as for cooperation between institutions and possible support/encouragement of new institutions to join the project.

It is necessary to provide access to computer equipment for students whose parents are unable to purchase the necessary equipment for training. Address the issue of quality Internet connection in the premises of the entire educational institution. Allow the use of gadgets for educational purposes. Create structured secure repositories of digital educational resources to support distance and blended learning, with free access for all participants in the educational process. Use applications for children with special needs. Improve the processes of assessing the knowledge and competences of students using digital technologies, engaging students in self- and mutual assessment. Promote the search and use of interdisciplinary links for teaching and learning.

CONCLUSION

The COVID-19 pandemic has proved the importance and necessity of digital competence for the well-being of the population, the development of economies and the digital society. The capabilities of a digitally developed society make it possible to create more effective governance mechanisms, expand access to livelihoods, including the provision of medical and educational services, and improve the level of public services. In a global sense, digitalisation is not only the use of technology, it is a much broader concept characterised by a change in the culture of behaviour and transversal transformations.

The modern education system in Ukraine and, directly, the educational process of each individual secondary education institution, needs a digital transformation that can ensure the quality and effectiveness of learning. By focusing on promoting digital citizenship among teachers and students, making it the basis of the educational policy of the educational institution, it is possible to create a high-quality and effective educational space for the new generation. This, in turn, will help the educational institution to remain relevant, offering students a modern level of education that is necessary for future success in life and further education. Using modern digital technologies in the educational process is the right way to digital maturity of all its participants.

The first step towards the digital transformation of the educational institution should be made by conducting a survey of the participants of the educational process regarding their skills, needs, desires and determining their readiness to accept innovations. Only having an understanding of the starting point, it is possible to develop roadmaps and strategies for building a digital education policy.

Monitoring the level of digital competence and digital readiness of all participants in the educational process is crucial. The SELFIE tool helps educational institutions to analyse and assess the current state of digital competence, create a specific digital transformation plan for each educational institution, and in the future improve curricula and processes in the field of digitalisation. SELFIE is a convenient and accessible resource for secondary education institutions in Ukraine. It is advisable to recommend it for wide use in secondary education institutions to develop their digitalisation strategies and educational policies.

REFERENCES

- Avast Academy Team. (2022). Retrieved from *Digital Literacy in 2022*. Avast: <https://www.avast.com/c-digital-literacy>.
- Blackburn, S., La Berge, L., & O'Toole, C. (2020, April 22). *Digital strategy in a time of crisis*. Retrieved from McKinsey & Company: <https://www.mckinsey.com/business-functions/>.
- Bykov, V. (2017). Suspilstvo znan i osvita 4.0 [Knowledge Society and Education 4.0]. *Osvita dlia maibutnoho u svitli vykykiv 21 stolittia (Polska edukacja w kontekście zmian cywilizacyjnych)*, pp. 30–45. Retrieved from <https://cutt.ly/uBybBST>.

- Carretero Gomez, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The Digital Competence Framework for Citizens*. Luxembourg: Publications Office of the European Union. <https://doi.org/10.2760/38842>.
- Concept of digital transformation of education and science*. (2021). Retrieved from Ministry of Education and Science: <https://mon.gov.ua/storage/app/media/news/2021/05/25/tsifrovizatsiigromadskeobgovorennya.docx>.
- Digital Competence Framework for Citizens*. (2021). Retrieved from Ministry of Digital Transformation of Ukraine: https://thedigital.gov.ua/storage/uploads/files/news_post/2021/3/mintsifra-oprilyudnyue-ramku-tsifrovoi-kompetentnosti-dlya-gromadyan/%D0%9E%D0%A0%20%D0%A6%D0%9A.pdf.
- European Commission. *Digital education*. Retrieved from European Education Area: <https://education.ec.europa.eu/focus-topics/digital-education>.
- Ionan, V. (2021). *Digital competence. What skills should be developed during the pandemic?* Retrieved from EU4Digital: <https://eufordigital.eu/uk/digital-competence-what-skills-do-you-need-to-develop-during-the-pandemic/>.
- Iordache, C., Mariën, I., & Baelden, D. (2017, 02). Developing Digital Skills and Competences: A Quick-Scan Analysis of 13 Digital Literacy Models. *Italian Journal of Sociology of Education*, 9(1), pp. 6–30. <https://doi.org/10.14658/pupj-ijse-2017-1-2>.
- JRC and ETF, N.T. (2021). *SELFIE Pilot Ukraine: Country Report, European Training Foundation*. Retrieved from Digitization of education: <https://mon.gov.ua/ua/news/ponad-20-tisyach-uchasnikiv-iz-96-zakladiv-osviti-v-ukrayini-zavershili-pilotne-vprovadzheniya-selfie>.
- Lytvynova, S. (2019). Informatyzatsiia i tsyfrovizatsiia zahalnoi serednoi osvity: initsiatyvy y osvितnie vprovadzhenia [Informatization and digitalization of general secondary education: initiatives and educational implementation]. *Informatsiino-tyfrovyyi osvितnii prostir Ukrainy: transformatsiini protsesy i perspektyvy rozvytku. Proceedings of the methodological seminar of the National Academy of Pedagogical Sciences of Ukraine*, pp. 130–137. Retrieved from <https://core.ac.uk/download/pdf/233898739.pdf>.
- Marzal García-Quismondo, M., & Cruz-Palacios, E. (2018). Gaming como Instrumento Educativo para una Educación en Competencias Digitales desde los Academic Skills Centres. *Revista General de Información y Documentación*, 28(2), pp. 489–506. <https://doi.org/10.5209/RGID.62836>.
- Mazorchuk, M., Tereshchenko, V., & Bychko, H. (2020). *PISA-2018: UKRAINE IN THE CENTER OF ATTENTION. Student collaboration and sense of belonging to an educational institution: Does it contribute to academic achievement?* Ukraine. Retrieved from http://pisa.testportal.gov.ua/wp-content/uploads/2020/10/PISA-2018_UKRinFocus_5_September_2020.pdf.
- Nikou, S., De Reuver, M., & Mahboob Kanafi, M. (2022, May 3). Workplace literacy skills — how information and digital literacy affect adoption of digital technology. *Journal of Documentation*, 78(7), pp. 371–391. <https://doi.org/10.1108/JD-12-2021-0241>.
- Ocaña-Fernández, Y., Valenzuela-Fernández, L.A., & Garro-Aburto, L.L. (2019). Inteligencia artificial y sus implicaciones en la educación superior. *Propósitos Y Representaciones*, 7(2), pp. 536–568. <https://doi.org/10.20511/pyr2019.v7n2.274>.

- Park, H., Kim, H., & Park, H. (2020, Jul 24). A scientometric study of digital literacy, ICT literacy, information literacy, and media literacy. *Journal of Data and Information Science*, 2, pp. 116–38. <https://doi.org/10.2478/jdis-2021-0001>.
- Professional standard of the head (director) of the institution of general secondary education*. (2021). Retrieved from Ministry of Economic Development, Trade and Agriculture: <https://mon.gov.ua/storage/app/media/news/2021/09/22/Nakaz-568-zatverdzh.standar-tu.keriv.22.09.pdf>.
- Professional standard of the primary class teacher, general secondary education teacher and primary education teacher*. (2020). Retrieved from Ministry of Economic Development, Trade and Agriculture: <https://www.me.gov.ua/Files/GetFile?lang=uk-UA&fileId=22dac6a-f0db-4de0-8d49-47aa6b2ecb99>.
- Redecker, C. & Punie, Y. (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*. Luxembourg: Publications Office of the European Union. <https://doi.org/10.2760/159770>.
- Study of digital skills of Ukrainians*. (2021). Retrieved from Ministry of Digital Transformation of Ukraine: https://osvita.diia.gov.ua/uploads/0/2623-research_eng_2021.pdf.
- Sukhonos, V., Harust, Y., & Shevtsov, Y. (2019). Digitization of education in Ukraine: foreign experience and domestic perspective of implementation. *Legal horizons*, 19(32), pp. 79–86. Retrieved from <https://essuir.sumdu.edu.ua/handle/123456789/78482>.
- The conceptual-referential framework of digital competence of pedagogical and scientific-pedagogical workers*. (2021). Retrieved from Ministry of Education and Science: https://osvita.diia.gov.ua/uploads/0/2900-2629_frame_pedagogical.pdf.
- Tsybalya, A. (2020). *How Ukrainian business has changed after COVID-19*. Retrieved from The page: <https://thepage.ua/ua/experts/yak-zminivsy-ukrayinskij-biznes-pislya-covid-19>.
- Viberg, O., Mavroudi, A., Khalil, M., & Bälter, O. (2020, 04). Validating an Instrument to Measure Teachers' Preparedness to Use Digital Technology in their Teaching. *Nordic Journal of Digital Literacy*, 1, 38–54. <https://doi.org/10.18261/issn.1891-943x-2020-01-04>.