







Educational Trainings as One of the Effective Forms of Digital Competence Development of Secondary School Teachers

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Abstract: The article considers possibilities of developing digital competence of teachers by using educational training as an optional form of organization of the educational process and professional development of teachers. Different approaches to the interpretation of the concept of digital competence of specialists, in particular practicing teachers, are identified. Described training as one of the active forms of obtaining knowledge in the system of continuing education of teachers. Given examples of online tools that were used during training sessions for practicing teachers to develop one of the main components of their professional competence – digital competence. Provided static data on the effectiveness of this form of digital competence development, obtained as a result of a survey of participating teachers described in the article of educational trainings.

1 INTRODUCTION


Intensive development of world civilization, global transformation of education, intellectualization of labour, as well as educational realities in a present pandemic, indicate that one of the current issues that needs immediate solution is the lack of proper digital education policy, low digital competence of teachers and students etc.


As stated in the Concept of the New Ukrainian School, one of the tools to ensure success is the end-to-end application of information and communication technologies in the educational process. In particular, it is emphasized that “the introduction of ICT in education should move from one-time projects to a systemic process that covers all activities. ICT will significantly expand the capabilities of the teacher, optimize management processes, thus forming important for our century technological competencies in the student” (Elkin et al., 2017). All this indicates that mod-


ern society needs a teacher who has relevant knowledge and is able to qualitatively meet the educational needs of consumers of educational services using advanced pedagogical and information and communication technologies.


However, it should be noted that this is possible only if the teacher is constantly updating his/her knowledge and skills development to teach qualitatively, but at the same time, as noted in the National Report on state and prospects of education development in Ukraine, to learn continuously when “education becomes a means to the aim of human development, which allows to establish its leading role, the purpose of which is to form the skills necessary to perform various functions – self-expression, self-realization, development of social relations and ability to act” (Kremen, 2017).


The active use of information and communication technologies by the subjects of the educational process contributes not only to the informatization of the education system (Fedorenko et al., 2019), but also to the growth of professional competencies of teachers (Bakum et al., 2019). One of the professional competencies that should be formed in the teacher of secondary education institutions is the competence in the field of information technology, the development of which is carried out through the use of integrated di-


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dactic systems, computer, Internet resources and distance learning (Shokaliuk et al., 2020).

The Law of Ukraine “On Education” defines competence as “a dynamic combination of knowledge, skills, thinking, attitudes, values, other personal qualities that determine a person’s ability to socialize successfully, conduct professional and / or further educational activities” (Verkhovna Rada of Ukraine, 2017).

Regarding the definition of competence in the field of information technology, there was no unambiguous approach until recently. Scientists often used a variety of terminology: “information competence”, “informational competence”, “information-digital competence”, “digital competence”, “information-communication competence”, etc. Recently, the term “digital competence” has become more widely used by scholars which first appeared in international documents and is widely used in foreign countries.

The issues of digital competence were covered in (Ferrari, 2011; Kuzminska et al., 2019; Leshchenko et al., 2021; Prokhorova, 2015; Scott, 2015; Vuorikari et al., 2016). In particular, the issues of development of digital competence of a teacher were shown in (Ivanytsky, 2020; Kartashova et al., 2018; Moiseienko et al., 2020; Spirin, 2010; Trubavina et al., 2021).

There are many definitions of digital competence, among them:

- confident and thorough use of information and communication technologies in such areas as work (employment opportunities), education, leisure, involvement and activities in society, which are vital for everyday socio-economic life (Kartashova et al., 2018);
- ability to use digital resources and information technologies, understand and be able to evaluate digital resources and content critically, communicate effectively (Scott, 2015);
- a set of knowledge, skills required to use information technology and digital media to perform tasks; problem solving; information management; cooperation; communication; creation and distribution of content; joint activities and meeting needs (Ferrari, 2011);
- the quality of the specialist, which indicates the level of qualification from basic visual perception and practical skills to more critical, evaluative and conceptual approaches to the use of ICT, as well as includes attitude and awareness in the field of ICT (Spirin, 2010).

In particular, digital competence of teacher is interpreted as:

- knowledge, skills and abilities in the field of ICT and the ability to apply them in professional activities (Moiseienko et al., 2020);
- the ability of the teacher to effectively and efficiently use ICT in teaching and for professional development (Prokhorova, 2015);
- the skill of the teacher to apply information technology in professional activities (Vuorikari et al., 2016), etc.

However, the features and ways of developing the digital competence of practicing teachers have been studied little and require additional research.

The *purpose* of the article is to reveal the possibilities of developing digital competence of teachers by using educational training as an optional form of organization of the educational process and professional development of teachers.

2 RESULTS

The problem of continuing education of teacher practitioners, whose professional activity occupies one of the leading places in the development of society due to modern paradigms of social development, novelty of personal and social requirements to the system of professional education of teachers and their readiness to improve professional development.

In our opinion, special attention should be paid to identifying ways to develop digital competence of teachers in the context of continuing education. Thus, Dryden and Vos (Dryden and Vos, 2005) see the main task of modernity in “preparing all educators in such a way that they know how to combine the best available information technologies in the world with the most advanced teaching methods available in the world and teaching”.

One of the active forms of acquiring knowledge in the system of continuing education of teachers is educational training. Training comes from the “to train”, which means “teach, train, instruct”. At the same time, training is an interesting communication and an exciting process of learning about yourself and others and an effective form of learning, expanding experience and a way to develop skills and abilities (Panchuk, 2015).

Unlike traditional, training forms of learning fully cover the full potential of student: the level and scope of his/her competence (social, emotional and intellectual), independence, ability to make decisions, interaction etc.

The effectiveness of this form of education is due to the fact that (Blinov, 2008):

- the point of view and knowledge of each participant is valued;
- there is an opportunity to share your experience and analyze it in a comfortable atmosphere without coercion;
- there is an opportunity to learn by performing practical actions;
- mistakes can be made that will not lead to punishment or negative consequences;
- there are no assessments and other “punitive” means of assessing new knowledge”.

In the framework of the international project “Modernization of Pedagogical Higher Education Using Innovative Teaching Tools” (MoPED) of the EU program Erasmus + KA2 – The Development of Higher Education Potential, No 586098-EPP-1-2017-1-EN-EPPKA2-CBHE-JP participants of Uman State Pedagogical University conducted a series of trainings for teachers of secondary education, regardless of their professional orientation.

According to statistics, the following distribution of teachers who participated in the trainings was obtained. Of the total number of training participants who received feedback, 10% teach in primary school, 54% – in secondary school, 36% – in high school. Among those who teach in primary or secondary school, depending on the subject they teach, we have the following distribution: humanities – 12.5%; social sciences – 2.1%; economic sciences – 4.2%; technical sciences (computer) – 25%; technical sciences (non-computer) – 27.1%; other fields (mathematics, chemistry, teacher-organizer) – 29.1%.

The level of digital competence of participants at the beginning of the trainings was mostly sufficient (38%) and average (62%).

The purpose of these trainings was to increase the digital competence of teachers, acquaint them with modern innovative tools and learning technologies. The topics of the trainings were as follows: “Go-Lab Ecosystem”, “Research Learning Technologies”, “Computational Thinking”, “Development of Digital Competence through Mobile Technologies”, “From Classical Lesson to Research Learning”, “Research Learning: Creating ILS on the Go-Lab Platform”, “Mobile learning technology: the use of Classroom in school practice”, “Technology of development of critical thinking in students”, “STEM-education: robotics, the use of sensors of mobile devices for physical experiment”, “Introduction of Flipped Classroom Technology in educational process”, “Technology “Six Hats”: the development of critical thinking of students”, “Technology “Scribing”: a vivid presentation of educational material”, “Mentimeter.com –

online survey in real time”, “Formation of soft skills in students during implementation of the educational process”, “The use of multimedia board as one of the requirements of modern educational process in the information society”, “Virtual interactive whiteboards as a modern means of educational material”, “Distance learning platforms and services” and others.

During the trainings, participants learned how to organize educational activities more effectively, store and create files in cloud storage, automatically evaluate student tasks and effectively organize work in groups etc. The team of trainers demonstrated a variety of free online tools for offline and online classes, for a vivid presentation of educational material, control of students’ knowledge etc. Here are examples of online tools that were demonstrated during the trainings and contributed to the development of digital competence of teachers and students.

One of the modern online tools that fascinates students regardless of their age is Kahoot! This is an educational service with which you can conduct interactive educational games: quizzes, discussions, surveys, etc. You can access it through a web browser or the Kahoot app! in Google Play or App Store.

During the trainings, participants had the opportunity to get acquainted with four options for registration on this service: Basic, which is free; Plus, Professional, Premium, which are paid. But even basic (free) access to the platform gives the teacher quite a lot of opportunities:

- allows to involve up to 50 students in testing;
- you can create questions yourself or use ready-made questions from the bank;
- you can enable the function for automatic mixing of answers to the question;
- to visualize the question, you can use a bank of images, add them to questions or use as answers;
- it is possible to limit the time given to the student to answer questions;
- you can determine the number of points for each correct answer;
- allows you to find out how each student answered the questions or build success charts of the academic group.

Free access allows you to create only two types of questions: quiz, namely a question with “multiple choice”, when the student is offered several answers and he chooses one or more correct and “true or false” when the student is offered two mutually exclusive answers (figure 2).

The offered service allows to carry out testing in two ways:

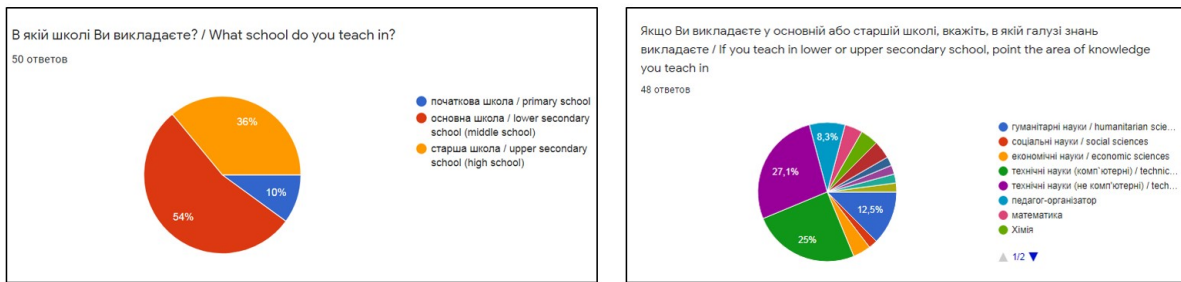


Figure 1: Distribution of teachers who participated in the trainings.



Figure 2: Types of questions in Kahoot!.

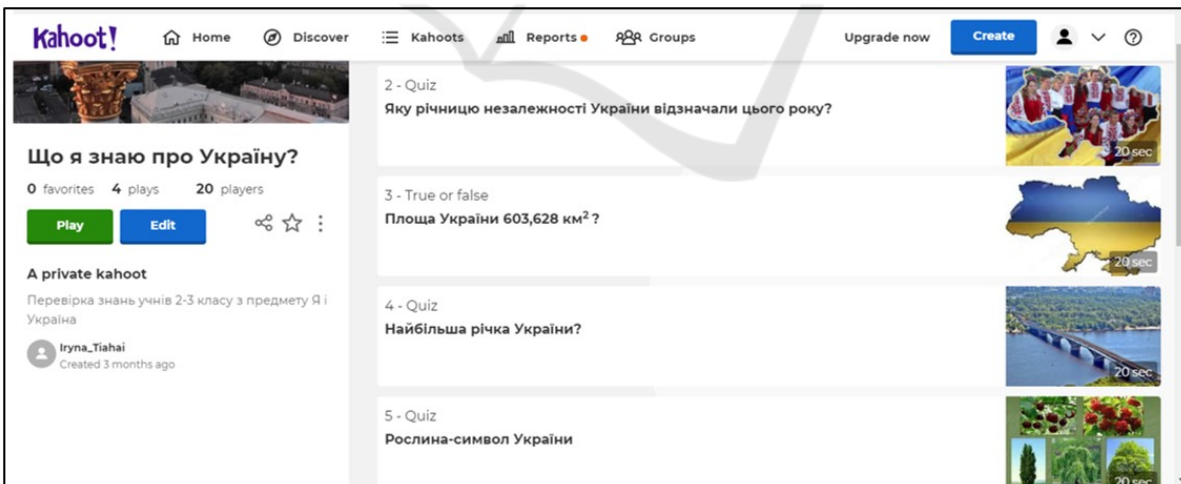


Figure 3: An example of Kahoot! for teachers.

- virtual classroom – testing can be taken with students during offline lessons. In this case, the questions and answer options appear on the projector or computer screen of the teacher and students answer from their mobile phones or computers;
- for self placed learning – students take tests on their own, questions and answer options appear on the screen of their computers or smartphones.

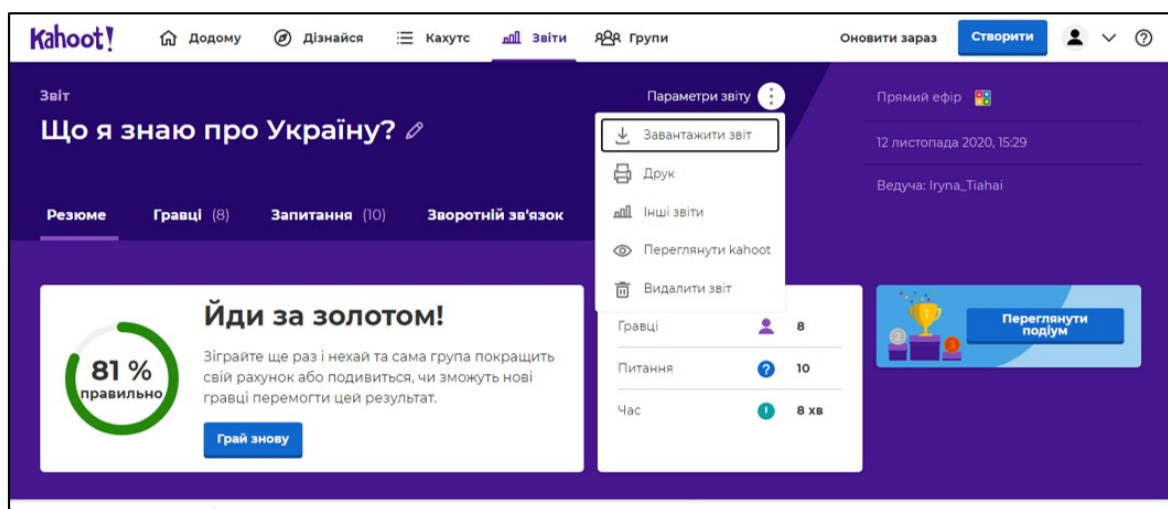


Figure 4: View and download the report.

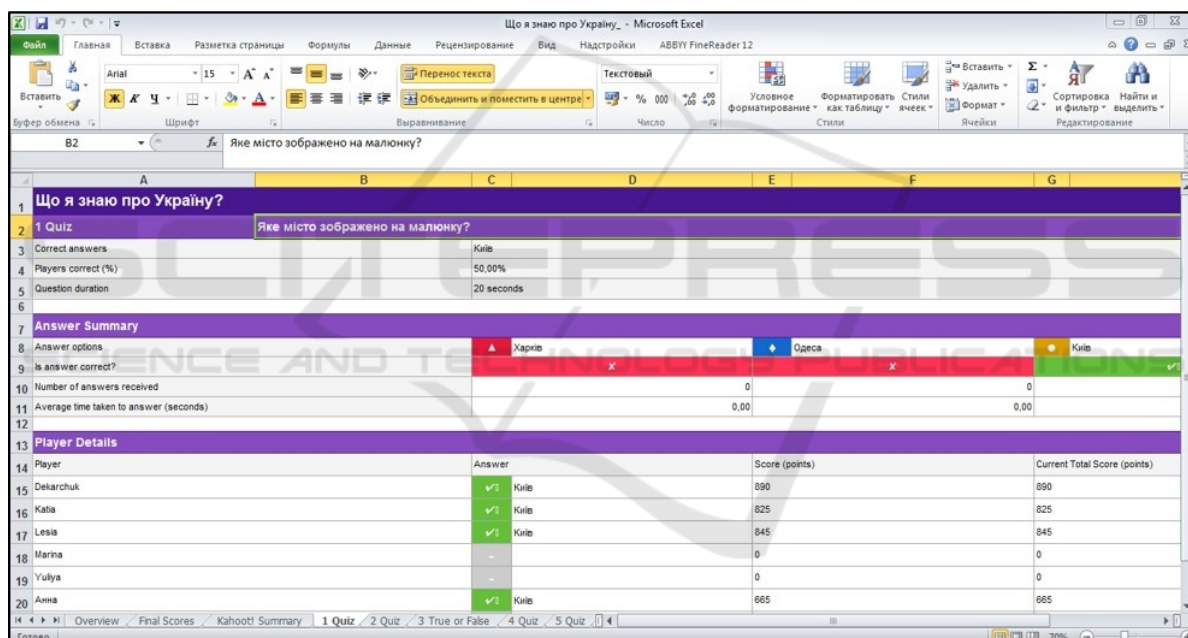


Figure 5: Kahoot! results report in Excel.

By choosing this method, the teacher has the opportunity to set the date and period of time during which the test will be open.

During the conversation at the training, all educators unanimously stated that during online lesson it is quite difficult to keep students' attention when explaining the material. Therefore, the trainers showed that you can try not just to tell the topic with the presentation, but to prepare the Kahoot test! and activate students with short pauses with interesting questions on the topic. Students can take quizzes individually, and it is possible to create competitions where par-

ticipants receive points for speed and correctness of answers. A small competition will always help make the lesson more interesting.

Since the training was attended by teachers from different subjects, in order to acquaint them with this platform, our team was offered to pass Kahoot! on "What do I know about Ukraine?" (figure 3). The work with this service was as follows: first, teachers took the role of students and passed the quiz, and then, after registration, independently created their own Kahoots in accordance with the subjects taught.

After working with this service, teachers came

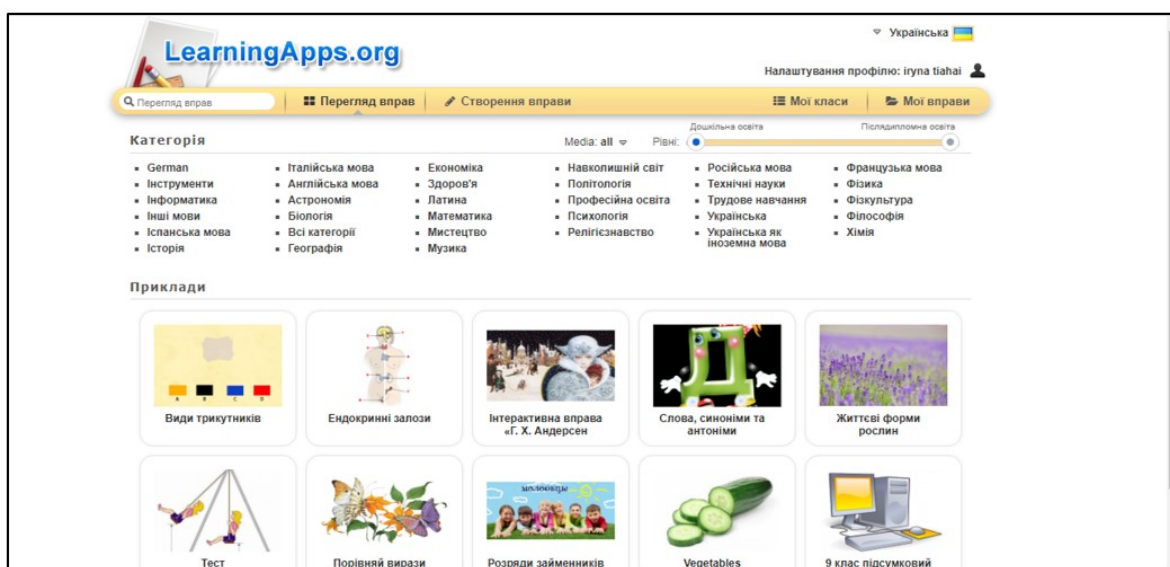


Figure 6: Service LearningApps.

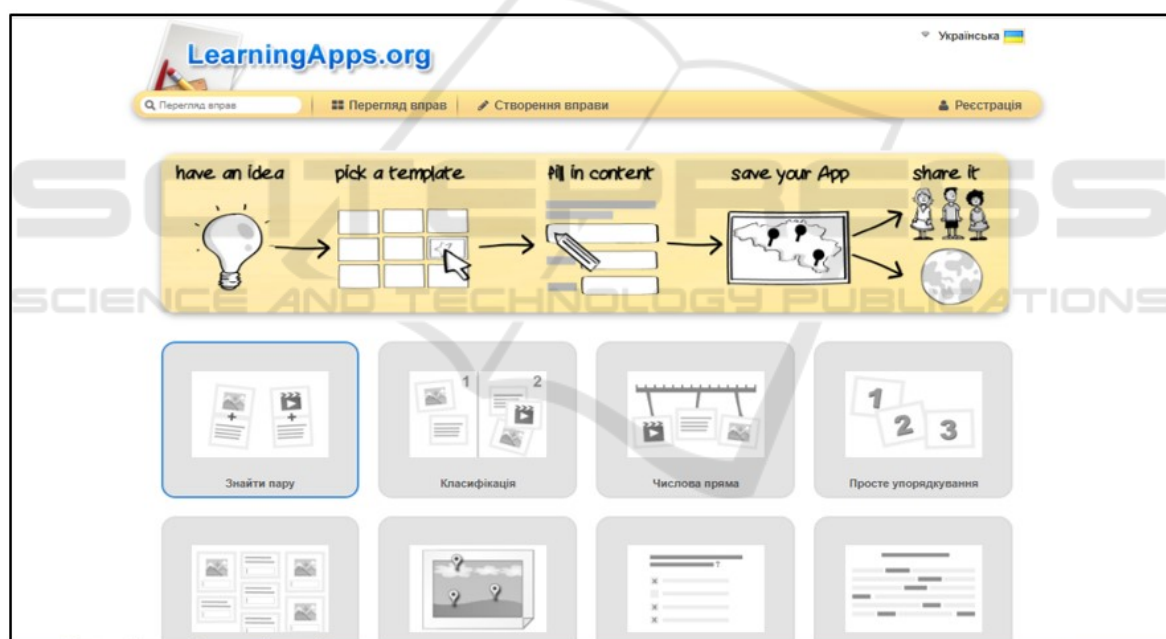


Figure 7: Types of interactive exercises in LearningApps.

to the conclusion that Kahoot! is a convenient tool for creating tests that can be used for: current and thematic control of students' knowledge; self-study and self-control; preparation for tests and independent work; survey of students' opinions, etc. The "virtual classroom" survey method can be used not only for classroom classes or distance learning. It can also be used during student conferences, research groups or other events where there is a need to involve students

in discussing scientific or educational issues.

The service allows you to download to Google Drive or PC file (figure 4) with the named results in Excel format (figure 5).

Another online service that allows you to create interactive exercises is LearningApps.org. This service is a designer for the development of various tasks in various subject areas for use in the classroom and in extracurricular activities and for kids and high school

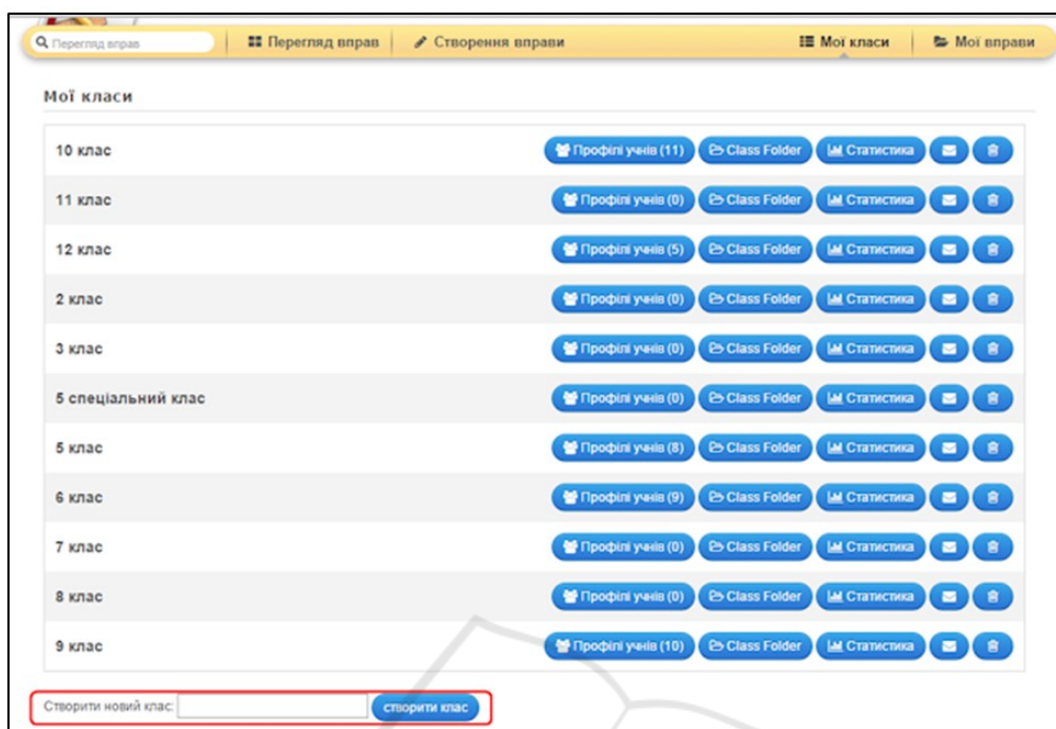


Figure 8: Creating a Class in LearningApps.

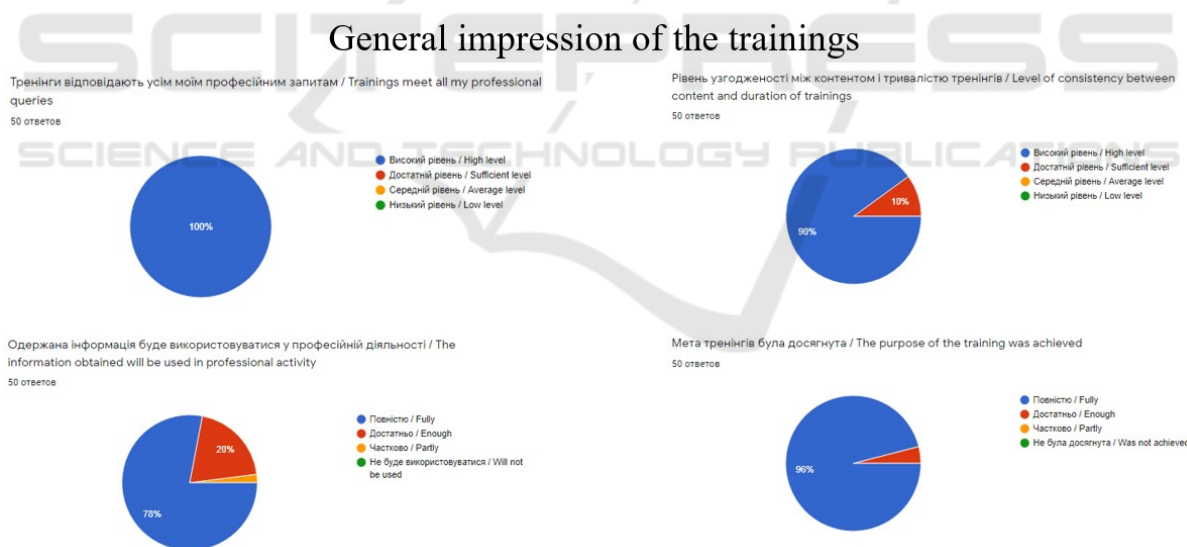


Figure 9: The results of the survey of training participants.

students.

LearningApps service is a Web 2.0 application to support educational processes in educational institutions of various types. Designer LearningApps is designed to develop, store interactive tasks in various subject disciplines, through which students can test and consolidate their knowledge in the form of games, which contributes to the formation of their cognitive

interest (figure 6).

The service presents many interactive exercises that have been developed for various forms of educational process. During the training, teachers were shown how these exercises can be used in working with an interactive whiteboard, as well as individual exercises for students when doing independent work.

The LearningApps service provides the ability to

Training methodology

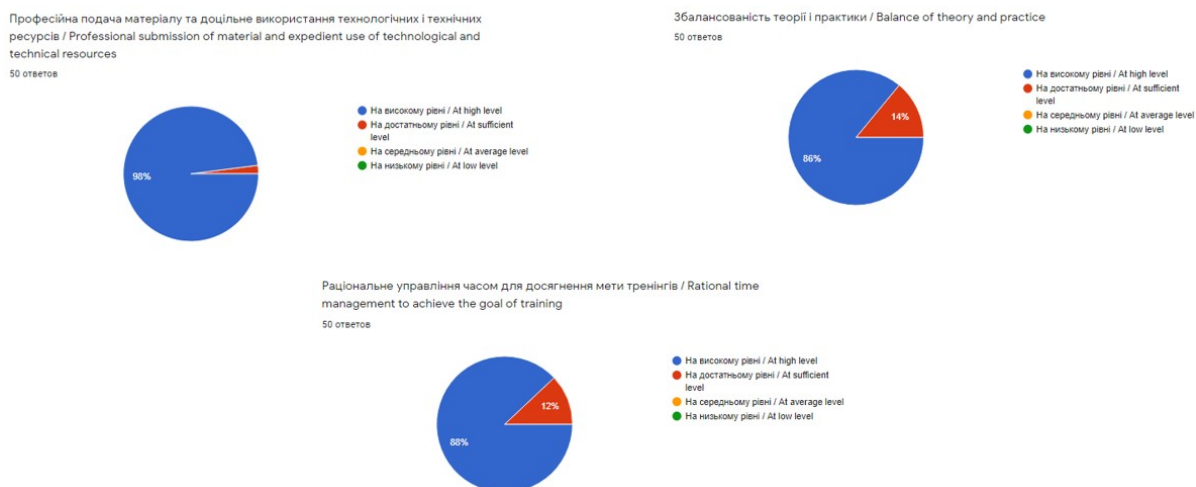


Figure 10: The results of the survey of training participants.

Technical and social competence of the trainer

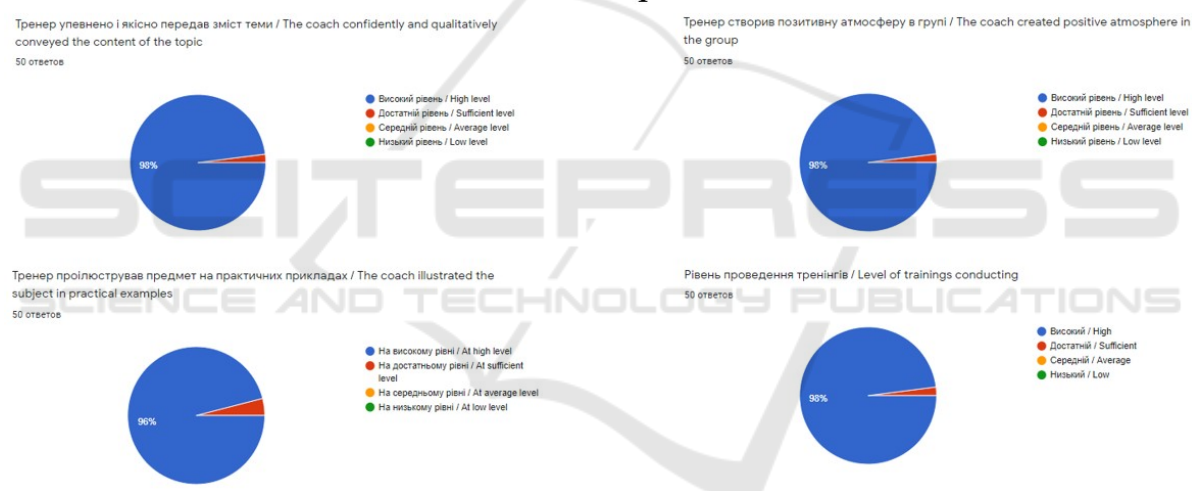


Figure 11: The results of the survey of training participants.

obtain code so that interactive tasks can be posted on the pages of websites or blogs of teachers and students. The trainers emphasized to the participants that each of the resources can be used in their class, changed for their own needs, develop a similar or completely different training module, it can be stored in your own “office”, creating your account in this online environment.

During the training, participants had the opportunity to get acquainted with the types of tasks offered by this service (figure 7), to play the role of a student, having already completed the exercise and to create their own interactive task under the guidance of trainers. There are several exercise templates available in each group, the description and samples of which can

be previewed before creating your own learning resource.

The participants of the trainings were shown the possibility of creating a Class in the teacher’s own account (figure 8), entering data about students, creating a profile for each student, setting a password to log in, etc.

This feature of the proposed service will be useful in connection with the current epidemiological situation in the country and in the world, as the teacher will be able to provide students with tasks remotely and monitor their implementation.

After working with this service, the training participants agreed that the Learning Apps service and its electronic versions of tasks are especially attractive

because they allow you to get results almost immediately after the test. Interactive learning tasks help increase the level of digital competence of teachers and students, as well as aimed at solving the most important task of education – to teach school leavers to work productively in the world of global informatization and in connection with global quarantine and the transition of all educational institutions to distance learning which is very important.

In addition to these online services, participants were also introduced to such services as: Mentimeter, Classtime, Plickers, ClassTools, etc during the training. The method of conducting trainings on the use of these services in the educational process will be described in more detail in the following publications.

At the end of the trainings, the participants were interviewed about the general impression of the trainings, the methodology of their conduct and technical and social competence of the trainers. 50 respondents took part in the survey. The results of the survey are presented in the form of diagrams (figures 9–11).

3 CONCLUSIONS

So, the growing role of ICT in education and everyday life requires the formation of digital competence of each individual. This process is entrusted to the teacher as the main agent of action and the engine of modern reforms. That is why there is a question of continuous improvement of their level of digital competence – quality, the formation of which allows teachers at a high professional level to use electronic educational resources to search, logical selection, systematization, use of educational material and effective educational process.

Further research should focus on the use of other innovative technologies, including the ClassDojo, Classtime platform, etc., to increase the digital competence of practicing teachers, as well as to find other training topics for the development of professional competence of educators.

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