

# OPPORTUNITIES OF USING INTEGRATION TO IMPROVE THE QUALIFICATION OF TEACHERS: TRADITIONAL AND DISTANCE LEARNING

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## ABSTRACT

*The article proves the urgency of the problem of teachers' professional development in higher education institutions. An analysis of the resilience of the education system to potential emergencies in the field of education is carried out. The expediency of integration in the educational process is substantiated and specific examples of its practical use are considered. Aspects of formation teachers' information competence in the process of professional development are revealed. Emphasis is placed on the development of various online courses on free open educational platforms (for example, Moodle and Learning management systems) as one of the leading tasks of modern educational institutions. The advantages and disadvantages of using distance learning systems are highlighted. The author's structure of the online course "Interactive Learning Technologies" for advanced training of pedagogical and scientific-pedagogical workers is presented. The emphasis is placed on the importance of theoretical material (video files, screen casts, submission of material through webinars), organized practical tasks (with detailed instructions and evaluation criteria), development of test questions and feedback. A number of requirements are prescribed by taking into account the limited interaction (communication) between the teacher and students of the above course, including clear formulation of tasks, definition of assessment criteria, availability of illustrative materials, method of sending answers (file, text, links). There is given an example of one of the workshops of the course, which is performed by students after participating in a webinar and watching video lessons. The specifics of work in Moodle software, services and experimental testing of the effectiveness of the online training course "Interactive Learning Technologies" are covered and there are presented the opportunities for its improvement.*

**Keywords:** Advanced Training, Teachers' Information Competence, Distance Education, Online Course, Online Platform, Pandemic Conditions, Educational Process, New Pedagogical Technologies.

## INTRODUCTION

Scientific understanding of integration processes that are actively developing in the society of the second half of the XX - early XXI century, could not but affect education. The growth of information, the intellectualization of labour, the rapid change of equipment and technology require constant development, modernization of education, bringing its condition and capabilities in line with the socio-economic needs of a developing society. Only those competent specialists who have a quite high scientific and technical potential, have modern innovation and communication technologies (ICT), have an active life position and the desire to work can contribute to the economic development of the state. The importance of academic staff in higher education institutions has always been determined at the critical stages of economic development of the country, it is seen as a real force that contributes to economic recovery. The rapid development of modern society, the introduction of new pedagogical methods and technologies require the introduction of fundamentally new approaches, such as time-consuming ones, to continuous improvement of IC teachers, those based on the need to respond quickly to extreme situations, including pandemics.

Since among the qualitative characteristics inherent in the information society, a significant place is occupied by such as constant mental activity of a modern teacher, the ability to select information and anticipate multiple solutions to unprogrammed pedagogical actions and problems and cooperation between specialists in various fields. Equally important is that the information environment has a very large impact on the minds of the modern professional, but not everything that is presented in the media is true, objective and useful. That is why one of the tasks of a modern higher education institution is to develop a variety of online courses on open educational e-platforms such as Moodle, Learning management systems (LMS), Prometheus, Coursera, EdX, KhanAcademy. Therefore, there is a need to form constantly the information competence of the teacher. With this in mind, one of the realizations of the above task is the presentation of the e-course “*Interactive Learning Technologies*” on the Moodle platform.

## LITERATURE REVIEW

The data used for this study were collected from the works of Zarei et al. (2016); Winter & McGhie-Richmond (2005); Gürbüz et al. (2009); Dogan (2010); Dabbagh & Kitsantas (2012) and others. The theoretical and practical provisions on integration, substantiated in this article, are also confirmed by the results of the authors Bhasin (2012); Gibbone et al. (2010); Treacy & O’Donoghue (2012); Pelgrum (2001); Dexter (2002); Cage (2004) and others.

The analysis of the sources shows that the formation of IR competence by teachers during various online courses, discussions, conferences, and webinars plays a leading role in training and is studied by scientists in the following areas:

The purpose of the article is to present the course “*Interactive Learning Technologies*” on the Moodle platform, which serves in forming the teachers’ information competence during training.

## RESEARCH METHODOLOGY

In our opinion, for a full development modern education needs the following approaches: classical - traditional (linear) analysis, which will organize and summarize huge empirical data,

and innovative (distance), which forms the modern foundations of education, especially for emergencies, such as pandemics). In recent decades, in addition to the attempts at global integration of sciences that have failed, there has been a rational and effective process of local integration in education. We believe that the optimal combination of homogeneous and heterogeneous knowledge in the content of educational material during the training or improvement of their skills contributes to the formation of quality knowledge and the development of intelligence. The most important thing is that integration is based on the revival of natural, objectively existing connections between the elements. Development as a process of emergence of new qualities, which differ significantly from the previous ones, is one of the most important signs of integration. Laws, dynamic and statistical patterns, the probability of events and processes that occur in different systems with an integrative approach are considered interdisciplinary. A number of phenomena that are seen as an opportunity in one area of knowledge become reality in another one. During the integration, the status of external and internal may change, which gives a more complete picture of the phenomenon or subject being studied. The essence and the phenomenon at the integrative approach turn out most completely, and also eliminate the danger of substitution of essence by visibility. Therefore, we emphasize that the integrative approach performs its methodological function only if its use is justified.

Therefore, given that the development of modern information technology is a priority of scientific and pedagogical activities in education, we can identify the following areas: improving the methodology and strategy for selecting content, learning methods and organizational forms, which are adequate to the development of personality in society; creation of methodical systems of training focused on development of creative potential of listeners, formation of ability to carry out information-educational, experimental-research activity, various types of information processing; creation and use of computer test, diagnostic methods to control the level of knowledge of students.

There are a number of advantages to using distance learning systems and disadvantages.

Advantages: unlimited choice of opportunities for a full presentation of the online course: submission and updating of educational material, testing, surveys; lack of geographical borders; free access to platforms; infinity in time.

Disadvantages: low bandwidth of the electronic network, the complexity of the course system on platforms.

Various platforms known as Learning management systems (LMS) are used to organize distance learning. Among them, the most common is Moodle (modular object-oriented distance learning environment), as it provides secure sharing of information, has the appropriate tools to organize the learning process, control its results, the formation of reporting documentation. The advantages of Moodle are also the ability to expand through third-party plug-ins, support for external tests, as well as a high degree of reliability and no restrictions on the number of listeners.

## RESEARCH RESULTS

### Theoretical Conclusion

The biggest advantage of using integration in learning is that the amount of integrated knowledge due to qualitative transformations of elements is less than the amount of elements of

knowledge that are integrated. This provision is based on the principle of consolidation and archiving of information. This process is possible by eliminating duplication of knowledge. In the practice of learning it is realized in the following way. By studying certain concepts or theories in purely subject-based learning, students learn a number of concepts and connections between them. However, if these systems are presented on the basis of an integrative approach, the newly formed system loses many unnecessary terms and connections. In other words, in the integrative integration of knowledge, by eliminating duplication of knowledge and differences in their designations, students receive the same necessary knowledge from all disciplines without intermediate connections, focusing only on the connections that are really important. Note that this approach does not negate the inherent interpretation of the studied material in each of the sciences, but only ensures its coordination and complementarity.

We are convinced that the theory of educational integration should be based on a system of laws and their consequences, which explain a significant number of empirical facts and have predictive capabilities. This is the positive role of educational integration in explaining a significant number of empirical facts and observations.

Traditional learning is characterized by inaccuracy of goal setting, poor controllability of educational activities, uncertainty and lack of repetition of learning operations, weak feedback and subjectivity of the assessment of goal achievement.

It is concluded that traditional approaches to learning require updating the types and kinds of learning.

Therefore, there is a special technological approach to building learning in general. It is based on programmed learning, the advantage of which is the focus on clear goals of the entire learning process. Teaching technology is a direction of pedagogical science, which deals with the construction of optimal teaching systems, the design of educational processes. At the heart of pedagogical technology is the idea of complete control of the educational process, design and reproducibility of the educational cycle.

Among the innovative learning technologies, we use the following for integration:

1. Developmental learning is the orientation of the educational process on the potential of man and their implementation. The structure of developmental learning provides a chain of subject tasks that are gradually becoming more complex, to create a new (without analogue in experience) scheme of solution, as well as hypothesizing, forming a principle (idea) and developing an original solution plan, finding a way to test the use of independently found new connections between data, searched and known. Problem-based learning is a kind of developmental, logically complete learning system.
2. Programmed learning according to the curriculum with the help of computer-based learning tools provides primarily the principle of dividing the material into small doses (steps), the principle of immediate assessment of response and the principle of individualization of the pace and content of learning.
3. Block learning is carried out on the basis of a flexible program that provides the ability to perform a variety of intellectual operations and use the knowledge gained in solving educational problems.
4. Educational module - the integration of different types and forms of education, which are subject to the general theme of the course or current scientific and technical problems. The modular division is based on a rigorous systematic analysis of the conceptual apparatus of the discipline, which makes it possible to distinguish groups of fundamental concepts, logically and compactly group material, avoid repetitions within the course and in related disciplines, reduce the course by a third. The module can be interpreted as a fundamental concept of the discipline - a phenomenon, law, structural plan or group of interrelated concepts, enlargement of the section or topic of the course.

Modular learning ideas are closely related to the integration of knowledge. Each module is provided with the necessary didactic and methodological materials, a list of basic concepts, skills and abilities.

In contrast to traditional teaching systems, in modular programs and integrated fields of knowledge, such an approach to structuring the content of educational material is formed. Modular learning and the use of integrative learning tools have a powerful potential (especially when used in a reasonable relationship) to form an integrative-subject learning system with the effective use of traditional and innovative technologies. Consolidation of information, construction of content units on a problematic rather than subject basis makes it possible to focus students' attention on the main, essential in the content of educational material. Integrative tools should be used as tools for building modules, and the principles of modular learning - for integrated courses.

### **Stages of Integration into the Educational Process**

1. Selection of basic elements of knowledge in a particular subject (topic or module) that are necessary for learning. This system of elements should provide the necessary minimum of knowledge and meet approximately the objectives of a particular educational process (school, training courses, etc.).
2. Ensuring intra-subject integration of knowledge, elimination of secondary educational material, the formation of basic knowledge in a particular system.
3. Introduction of integration within a certain module or topic, which ensures the unity of the knowledge basis (coordination of the interpretation of related phenomena, timely provision of propaedeutic knowledge, a single system of notation, etc.).
4. Integration of general and auxiliary knowledge to ensure the acquisition of professional knowledge and skills.
5. The integration of knowledge, skills and values as professional competencies of the teacher contains all previous developments, but requires their coordination. This is where theoretical knowledge about integration and a clear understanding of the chosen level of work are especially needed: interdisciplinary links, learning profile, knowledge synthesis, knowledge complexes around a subject or object, and integration itself - the interaction of knowledge that differentiates them. Theoretical developments in the integration of knowledge show its effectiveness in teaching.

### **Practical Results**

Many teachers have a vague idea of the possibilities and means of integrative knowledge formation. 50 teachers were interviewed about their ideas of the importance of knowledge integration and the possibility of implementing an integrative approach in practice. For the quantitative assessment, a stem scale was used, in which respondents were asked to rate the role of the integration of knowledge in professional training (I) and their implementation in practice (II). The results of the survey allowed us to conclude that there is a significant difference between the necessary and existing processes of integration of knowledge in the assessment of practical teachers who will undergo training. We analyzed the scatter of results in two more aspects. Firstly, greater integration of knowledge is given by teachers with more teaching experience and higher ratings. Secondly, the importance of the integration of knowledge is greater considered by teachers of general education subjects, rather than professional ones. At the same time, there is a clear trend showing that the importance of knowledge integration is much higher than its use in the real learning process.

We are considering specific examples of the use of integration in the conditions of distance learning in the system of professional teachers' development.

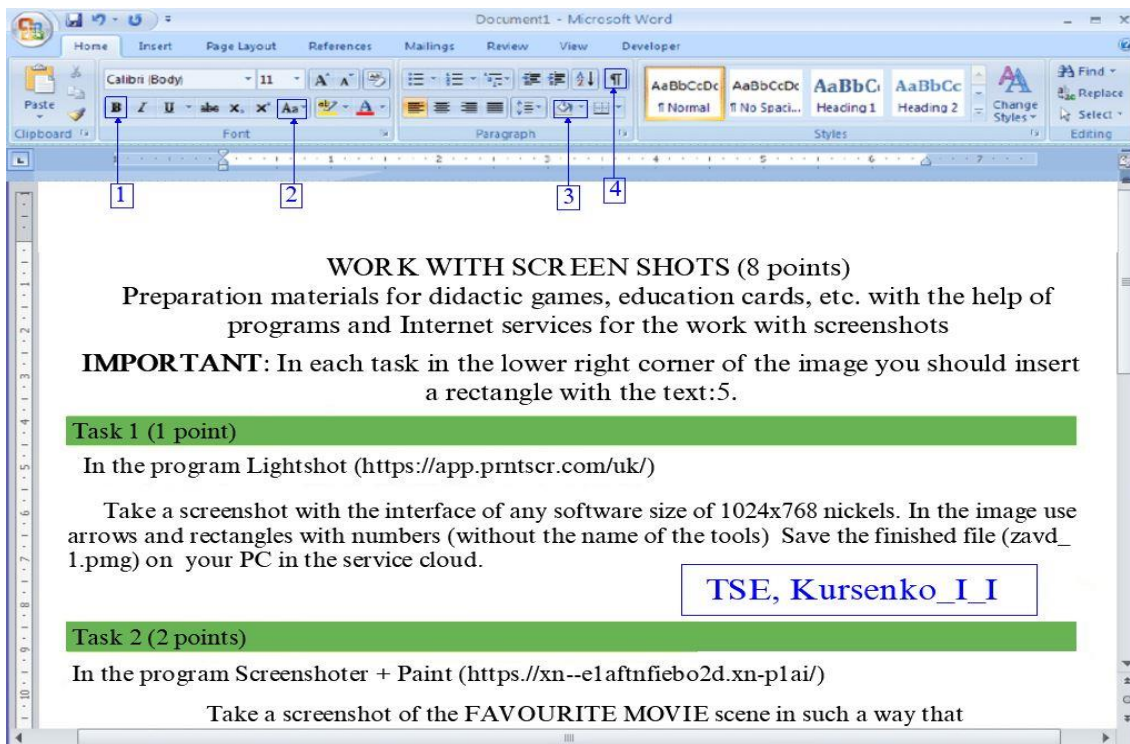
The most popular form of education among teachers as well as research and teaching staff of higher education institutions are distance learning courses.

As our practice has shown, the optimal duration of a distance course is 30 hours. This course combines 4 topics (modules), each of which can contain theoretical material (in the form of abstracts, video files, screenshots or submission of material through webinars with access to the record); practical tasks (one or more, with detailed instructions and evaluation criteria); test questions (it should be noted that they may not be); feedback (chat, forum, etc.).

Due to the limited interaction between the teacher and the students of the distance course, all elements of the course must meet a number of requirements:

1. Tasks are clearly formulated, do not require clarification.
2. Evaluation criteria are defined and the distribution of points is indicated.
3. Availability of a sufficient number of illustrative materials.
4. The specified method of sending a response (file, text, link).

Below is an example of one of the practical works from the course “*Interactive Learning Technologies*”, which is performed after participating in a webinar and watching video lessons, which introduce students to the installation and features of work in these software tools and services (Figure 1).



**FIGURE 1**  
**A SAMPLE OF A CORRECTLY PERFORMED TASK №1**

Here is the analysis of the work performance (in this course the student has 3 attempts to pass it with the maximum number of points). Note that video instructions for such tasks are constantly available to students, and the work of programs was demonstrated during the webinar (recording is also available).

The title of the paper states that for each task you should insert a rectangle with the text: TSE, name and initials of the student. More than 25% of the students in each group "do not see" this condition for the first time.

Task No-1 has size problems (1024x768 pixels), and tool names appear instead of numbers. Sometimes any image or diagram is used instead of the software interface. The file is called freely (including Cyrillic), a screenshot is not placed in the cloud (in tasks 3 and 4, similarly).

In task No-2, a frame is cut without the program in which the viewing is performed; replica clouds are drawn with screenshot tools (Paint is specified in the task); sometimes there are no remarks at all. The color of the text and symbols for readability are sometimes not taken into consideration (red - on black, yellow - on green).

In task No-3 there are problems with the size (800x600 pixels), the filling algorithm is written without the corresponding symbols (arrows, numbers). Tasks No-4 are performed in another software tool (cannot be installed); instead of one's own photo a picture from the Internet is used. Task No-5 is sometimes not performed at all (it is not placed in cloud environments); screenshots are saved on Google Drive or in the cloud of one of the services.

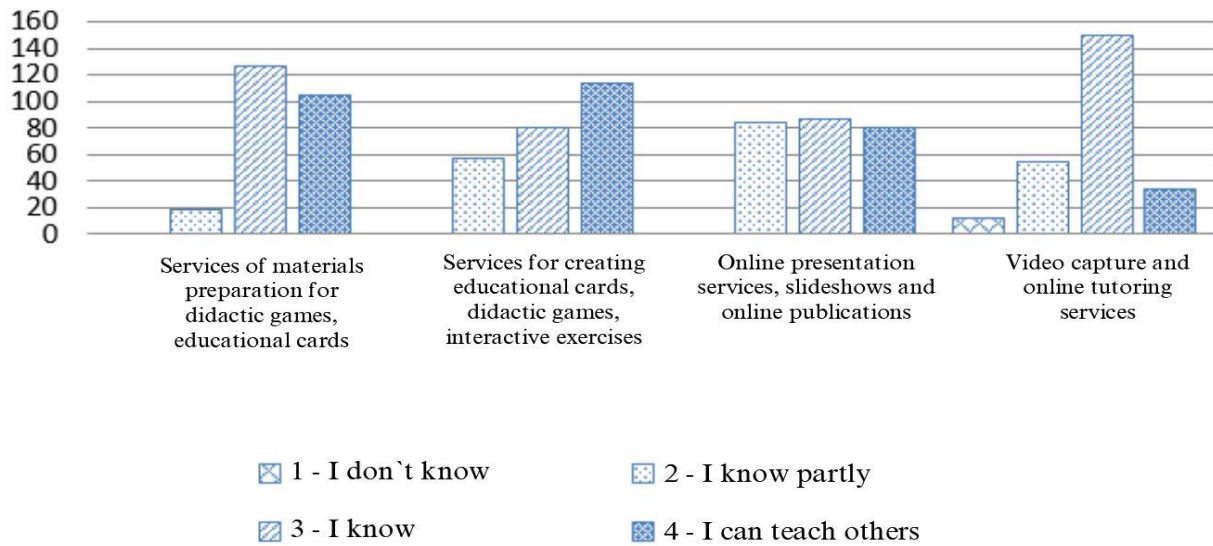
The biggest problem of this task is the creation of an archive (which is not studied within the course). We anticipate that the size of the archive will generally exceed 2 MB, as students take full-screen screenshots, while tasks 2-4 do not provide for this. After receiving a consultation (through messages or comments) on the need to "cheat" with the size of individual files, students successfully cope with the problem (no direct hint is provided). There are cases when the use of Cyrillic for file and archive names does not allow you to open the archive.

Thus, the following conclusions can be drawn, which are direct consequences of "webinar certification": students inattentively read the terms of the tasks (haste or low level of motivation); the tasks are performed formally (as student think that nobody will check them) and seem cumbersome, because no one planned to spend "so much time" on them.

Therefore, after the successful completion of the course "Interactive Learning Technologies", we have developed a "Graduate Questionnaire".

In our opinion, the questionnaire outlines a number of questions, after receiving answers to which it is possible to identify problematic aspects of pedagogical and scientific-pedagogical workers in the educational process of higher education institutions. That is, we have compiled a list of questions about the importance of using the latest ICT and working with remote platforms. We will review and analyze some of the answers received (the total number of respondents - 250 listeners).

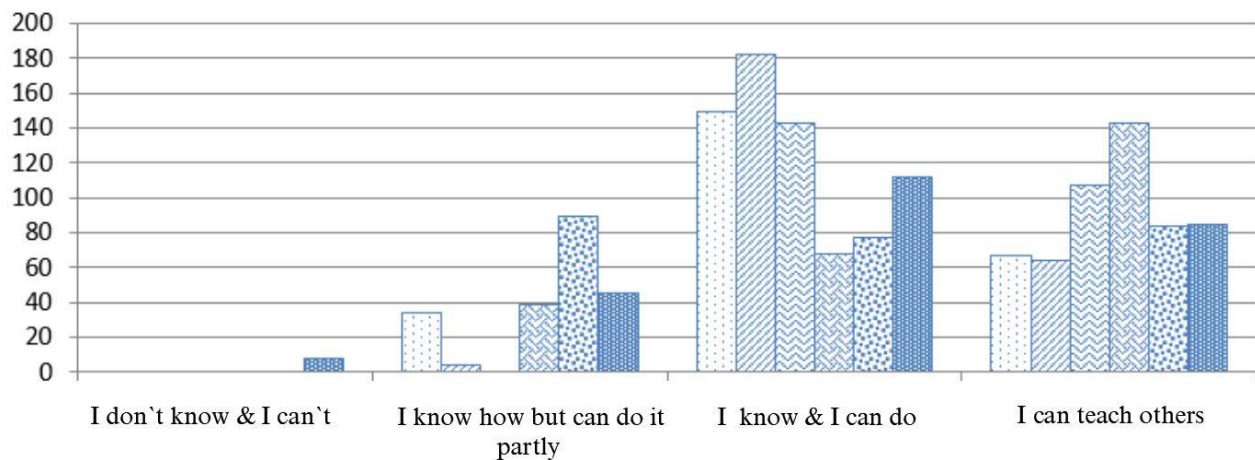
For example, a question: Assess your level of mastery of the material after completing the course (Figure 2).



**FIGURE 2**  
**SELF-ASSESSMENT OF THE LEVEL OF MASTERING THE MATERIAL AFTER COMPLETING THE COURSE**

Only in topic 4 - Services for capturing video and creating online lessons - there are students who answered “*I do not know*” (12 people or 5%). As a more detailed analysis showed, the main problem is the technical support, which created difficulties in performing the task. This creates a fear of using PCs and ICTs. Option “*I know partly*” - is reflected in all topics, but, as can be seen from the diagram, in topic 1 - Services for the preparation of materials for didactic games, training cards - it is the smallest (18 people or 7%). It is worth noting that almost all respondents indicated that they will use the services of topic 1 in their work. The level of mastering the material is qualitatively evidenced by the indicator “*I can teach others*”, which in three topics is in the range of 32-45%.

Even more detailed formation of skills in working with services reflects the answer to the question: Assess your level of mastery of the material by type of work (Figure, 3).





### FIGURE 3

#### SELF-ASSESSMENT OF THE LEVEL OF SKILLS FORMATION BY TYPES OF WORK

The largest percentage - 73% of students - showed the ability to involve students in active learning and learning material in the form of games. Given that the main purpose of the course "*Interactive Learning Technologies*" is to turn a trivial lesson into an interactive one, we can definitely say - the purpose of learning has been achieved. We have to note that a smaller percentage of listeners are able to record video than to add elements of interactivity to the video (we also found an important psychological aspect: teachers are ashamed to post their photos, let alone take pictures for themselves).

The results of the survey on the number of practical works on the course were interesting (This course is designed to perform 7 (seven) workshops (one in topic 1 and two for topics 2,3,4). If the majority of students (56% or 140 students) consider 29% or 72 people (almost a third) are not ready to work intensively and offer to reduce this number, while 15% of students are ready to increase the workload. An important fact is that each workshop is provided for the possibility of repeating the task; more than 85% of students (each tried to score a maximum of points). So the conclusion is that for each topic of the course should be offered 2 workshops.

The effectiveness of training in each topic was checked not only by performing practical work, but also by testing. The test was formed by selective selection of 4 questions out of 10, the number of attempts - is not limited, the type of evaluation - the best score, the minimum score for the answer parameter - 0.25 points.

According to the results of the survey on the assessment of course tests, students answered: "*Very simple and do not reflect the material studied*" - 4%; "*Adequate, demanding attention and covering the theory*" - 88%; "*Too complex, need additional literature*" - 8%. Despite such a high assessment of the quality of the testing process, students expressed their wishes about the need to make changes to the testing parameters.

All of the above changes concern the establishment of additional limits (number of attempts, response time, average score), which will lead to a decrease in overall performance. This can be explained by the lack of understanding of formative assessment technologies, which provides an opportunity to continuously improve their own results.

Discussion issues include issues directly related to integration in the field of education. It is important not to overload any educational process with excessive integration, but to focus on its optimal use. A number of problems are created by the presence of false integration, masking the term of integration of processes that are not integration in the scientific sense.

As the growth of information and intellectualization of labour, rapid change of equipment and technology require constant development, modernization in all areas of education, bringing its state and capabilities in line with the socio-economic needs of developing society, through the use of various courses (trainings, workshops, training seminars) on online platforms pedagogical and scientific-pedagogical workers have the opportunity to constantly improve their skills.

In general, the students of the course positively evaluated the results of their studies. Among the wishes to improve the course were most often: to increase the duration of the course; reduce the number or volume of practical work; to consider in screen-castes those tasks which will be in practical work, instead of similar; at the introductory lectures it is expedient to get acquainted with the terminology that will be used in practical works; it is better to conduct such

courses during the holidays. But the largest percentage, over 55%, said succinctly: you can leave everything unchanged, no comments.

## CONCLUSION

Thus, on the basis of the above material we can draw conclusions: 1) the formation of a positive attitude to distance learning as such, allowing at a convenient time, at their own pace to form a number of important professional competencies (including information and communication) ; 2) the necessary initial courses in computer literacy and work with remote platforms (mailbox registration, account creation, basic skills of working with the operating system, information retrieval, etc.); 3) professional development through webinars should include active activities of the listener, which can be checked through testing, practical exercises, etc. (the number of hours can be indicated as the sum of hours of work during the webinar and to perform tasks/tests).

Thus, the involvement of innovative technologies in the educational process stimulates the progress of higher education, turns it into a dynamic field of training of pedagogical and scientific-pedagogical workers who will constantly improve their skills.

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