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Modernisation of Higher Education in Central Asia through New Technologies (HiEdTec)

RECOMMENDATIONS FOR ADAPTING THE CENTRAL ASIAN HE SYSTEM TO THE NEEDS OF THE DIGITAL GENERATION

(REPUBLIC OF TAJIKISTAN)

Project: Modernisation of Higher Education in Central Asia through New Technologies (HiEdTec)

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1. Introduction

Tajik Technical University named after M. S. Osimi conducted a survey of students and faculties of Universities to get feedback about the level of implementation of digital tools in higher educational institutions of the Republic of Tajikistan.

Initially, the questionnaire was entered into Google form, but due to the fact that a number of web-sites were blocked in the country for technical reasons, and respondents did not have access to Google forms, 850 questionnaires were printed out and, with the assistance of the Ministry of Education and Science of the Republic of Tajikistan, were distributed to Universities in the country. The survey has been filled in by representatives of 23 universities with different areas of study. Among them are state regional multi-purpose Universities, technical-, medical-, economic-, pedagogical- and economic Universities.

2. HiEdTec Questionnaire Results

The total number of respondents which participated in the survey is 805. 44.72% of them are teachers and researchers, 55.28% are students. The structure of respondents can be viewed in more detail in Figure 1. Thus, it was possible to find out the opinion of both teachers and students, which makes the survey results more reasonable.
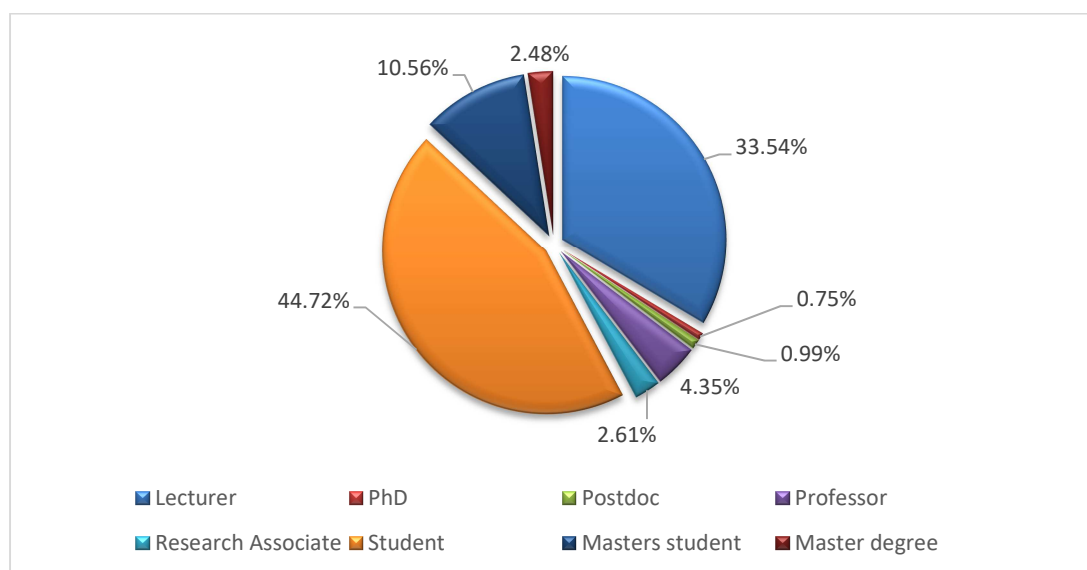

Figure 1. Structure of the respondents

The questionnaire includes 19 questions and consists of 6 parts:
- A. Teaching methods, approaches and techniques;
- B. Educational technologies;
- C. Educator qualities;
- D. Status of innovative teaching in higher education classrooms;
- E. Quality assurance of the teaching and learning process;
- F. Continuous professional development of teaching staff;

The next section provides a description of the survey results.

2.1. Methods, Approaches and Methods of Training

Question 1. How important is it for you to use teaching methods and/or approaches to achieve better learning outcomes?

The results of the responses (Fig.2) show that most teachers and students are aware of the importance of using certain approaches and methods to improve learning outcomes.

Thus, they believe that to use certain approaches and methods to improve the effectiveness of training:
- very important – 67 %;
- important to a high degree – 25% (4 and 5);
- important – 6.4% (2 and 3);
- only 1.6% of the respondents think, that they are not important.

	%
1	0.5
2	0.6
3	5.3
4	10
5	15.0
Not important	1.6
Very important	67.0

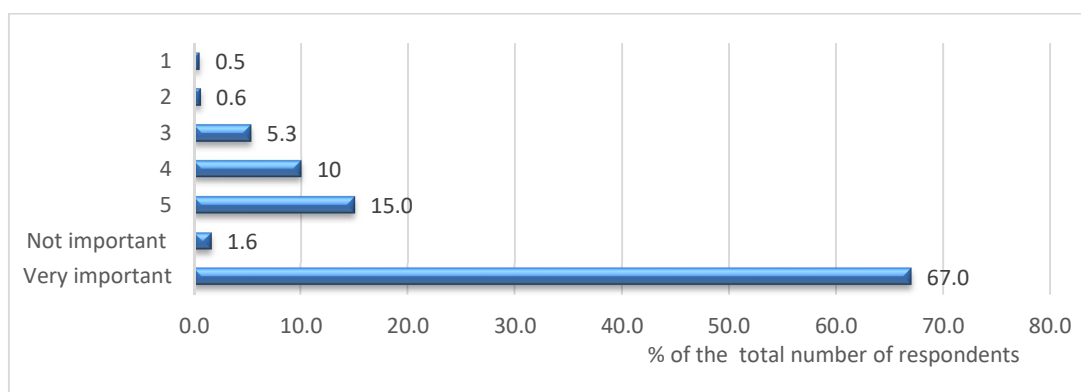% of the total number of respondents

Figure 2. Results of the answers to the question "How important are teaching methods and / or approaches to achieving ideal results in education for you"?

Question 2. What innovative teaching methods do you know?

Analysis of the results of the answers to this question showed that the respondents indicated about 4 dozen different, in their opinion, innovative methods of training (figure 3). The most frequently noted answer is practical training 18.01%, among the most common answers, there are some of them: add multimedia elements in the presentation (16.64%), adaptive training programs (11.89%), the use of video in mini-lessons (3.67%), provide online activities for students who complete tasks ahead of time, Storytelling, playing Pod scats, role-playing games, open projects, online activities, etc. Less popular are use of virtual manipulators, online mind maps, Twitter hashtags and some others.
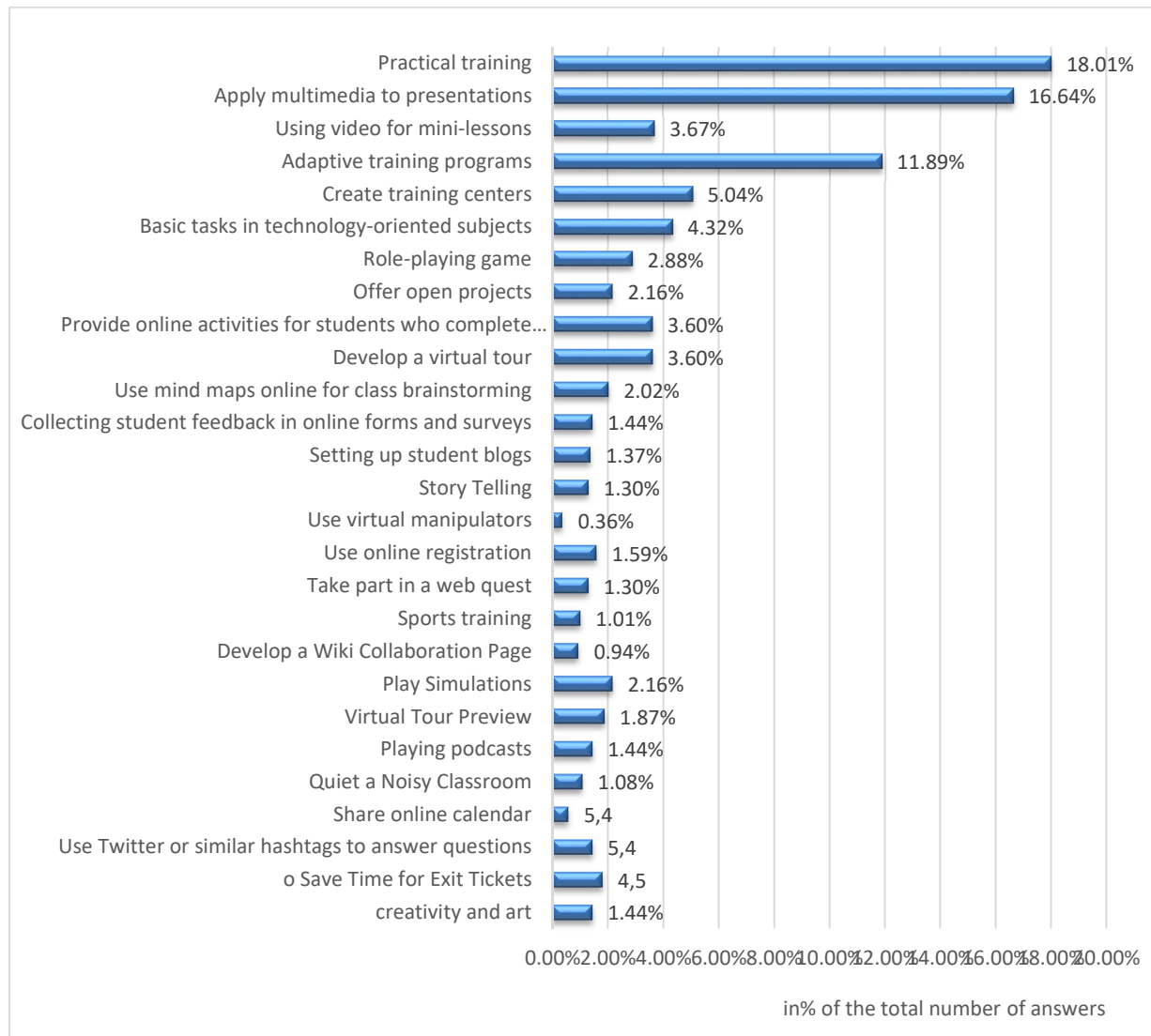

Figure 3. Histogram of answers to the question "What innovative methods Training do you know?"

Respondents ' answers showed, that the largest number of them use practical training (29.76%) more less use multimedia elements in the presentation (5.95%), the use of video for mini-lessons (5.95%), adaptive training programs (8.10%), storytelling (5.36%) as well as play pod casts, role-playing games, open projects, collecting the results of students' survey in online forms and surveys, mind maps, student blogs, web quests and some others (figure 4). The results of the answers to this and previous questions allow us to conclude that the known methods of teaching are used by teachers in the educational process, but till now the innovative methods are not so popular in using.
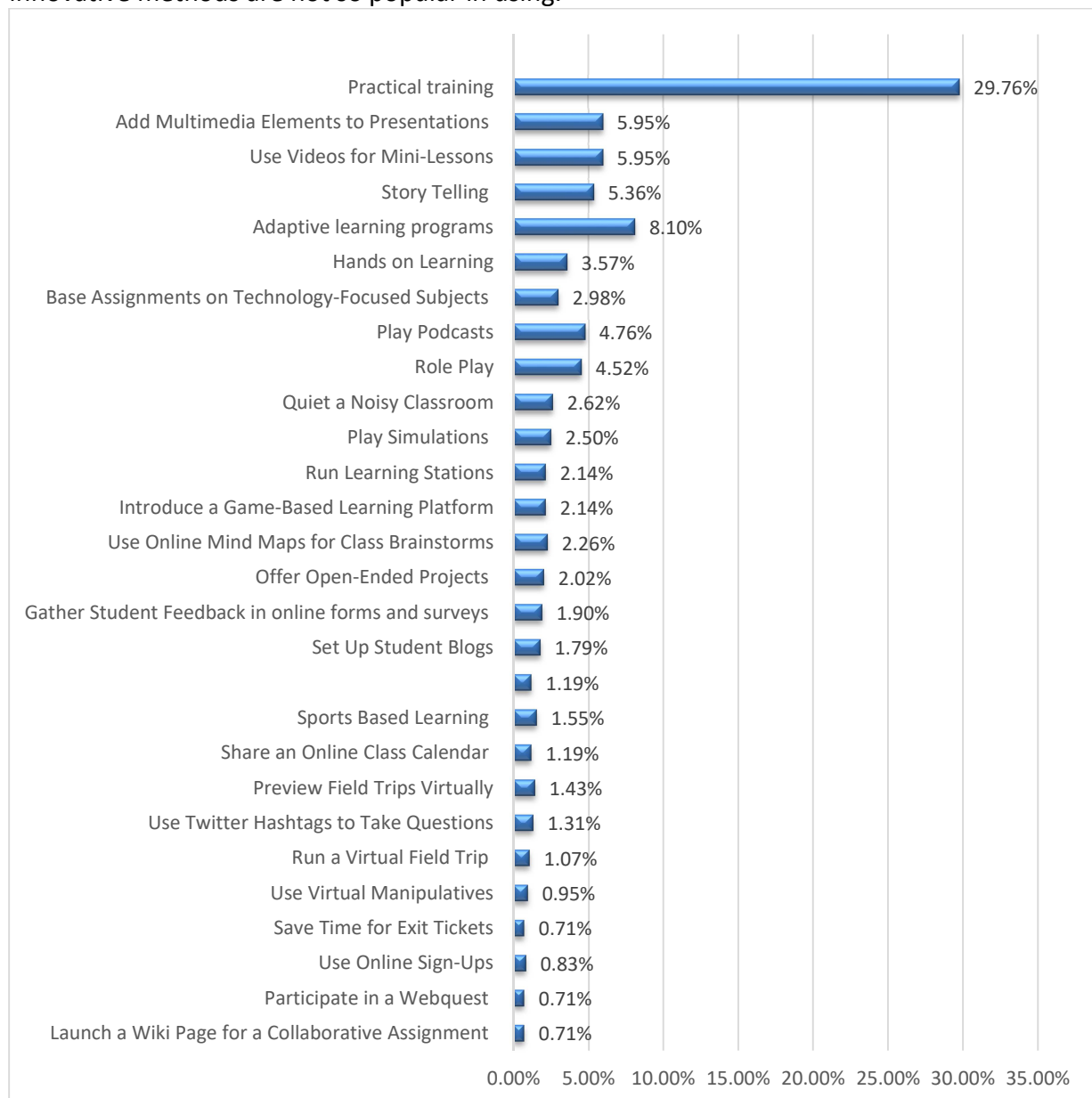

Figure 4. Histogram of answers to the question "What innovative education methods do you apply at your University?"

Question 4. What teaching methods by your experience are the most useful and achievable for teaching students (including those that do not exist at your University)? Why?"

One of the most common answers are "project-oriented learning" and "active mobility learning", which are based on the experience of practical research, while the student needs to update all their scientific and educational information, remember and get practical skills, as well as to analyze the information and learn experience of international Universities with joint sharing of knowledge between the students. Active teaching methods – Inquiry-based learning (IBL), Problem-based learning (PBL), Project-based learning (PjBL), promote active thinking, develop creative thinking, learn to work in a team, develop students' self-education skills. Interactive presentations and videos contribute to better assimilation of information.

Question 5. What teaching methods, in your experience, are the most useful and purposeful for teaching students (including those that do not exist at your University)? And why?

According to the respondents, the most useful method is an interactive method which includes the simulation of life situations, the use of business and role-playing games, joint problem solving. It is also based on the principles of interaction, student activity, and reliance on group experience, mandatory feedback, discussion method, group work, case study, and brainstorming.

Currently in the world, there are major changes in the education system. One of the factors that determined the reorganization of the university model of education is globalization, which has affected almost all aspects of modern life, and the informatization of the educational process associated with innovative computer technologies.

2.2. Educational Technologies

Question 6. What educational technologies do you know?

Analysis of the results of the answers to this question showed that the respondents indicated about 4 different, in their opinion, innovative learning technologies (figure 5).

The most frequently noted answer is mobile learning 20.87%, among the most common answers, there are 10 of them: 3D printing (18.51%), tablet computer (15.53%), virtual and remote laboratory, open content and training Analytics, games and gamification, cloud computing and etc. More respondents are not familiar with MOOCs, live binders, LessonCast, Study Blue, LEAP Motion and others.
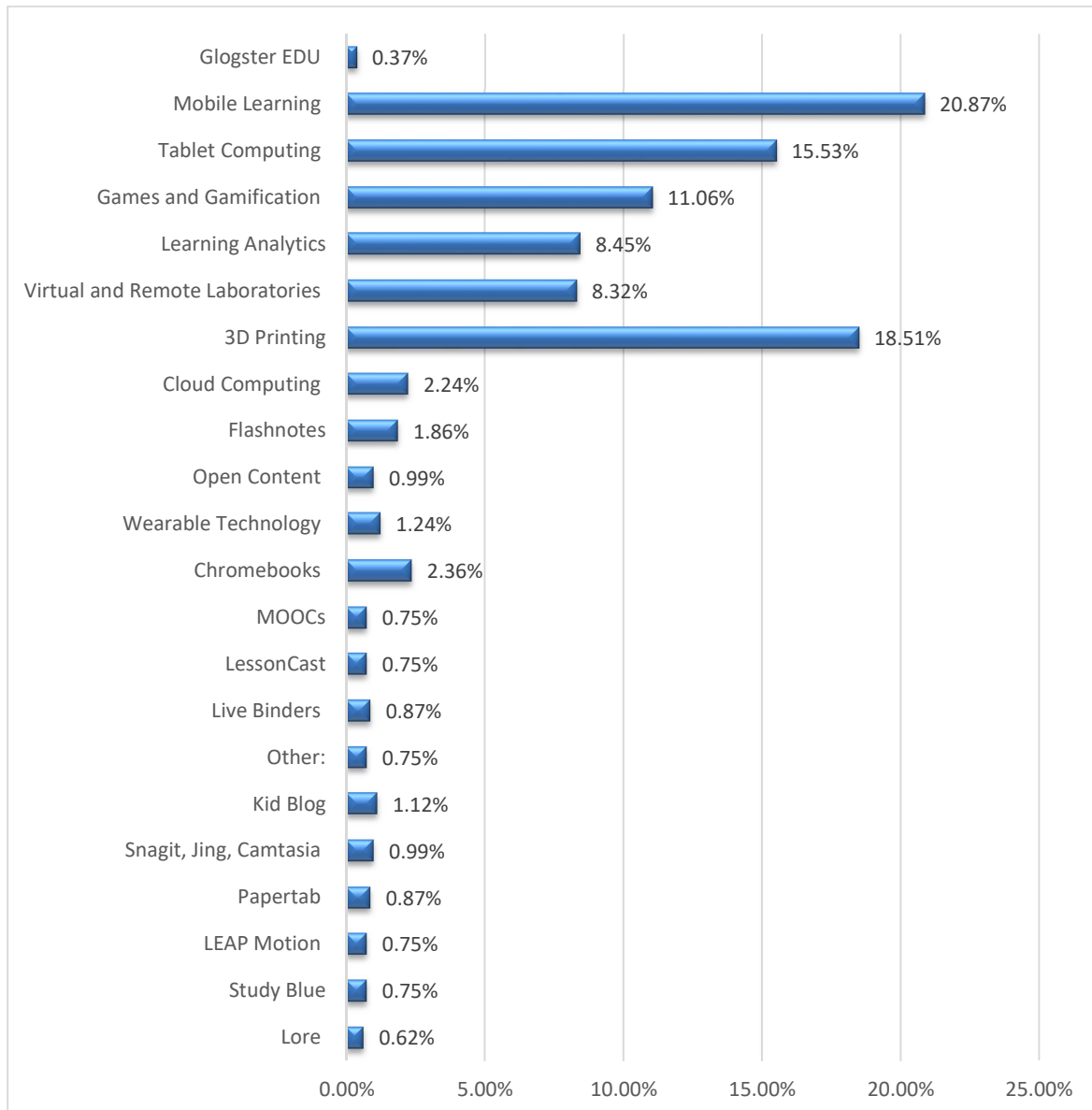
Figure 5. Frequency of answers to the question "What educational technologies do you know?"

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Question 7. What educational technologies are used in your University for education?

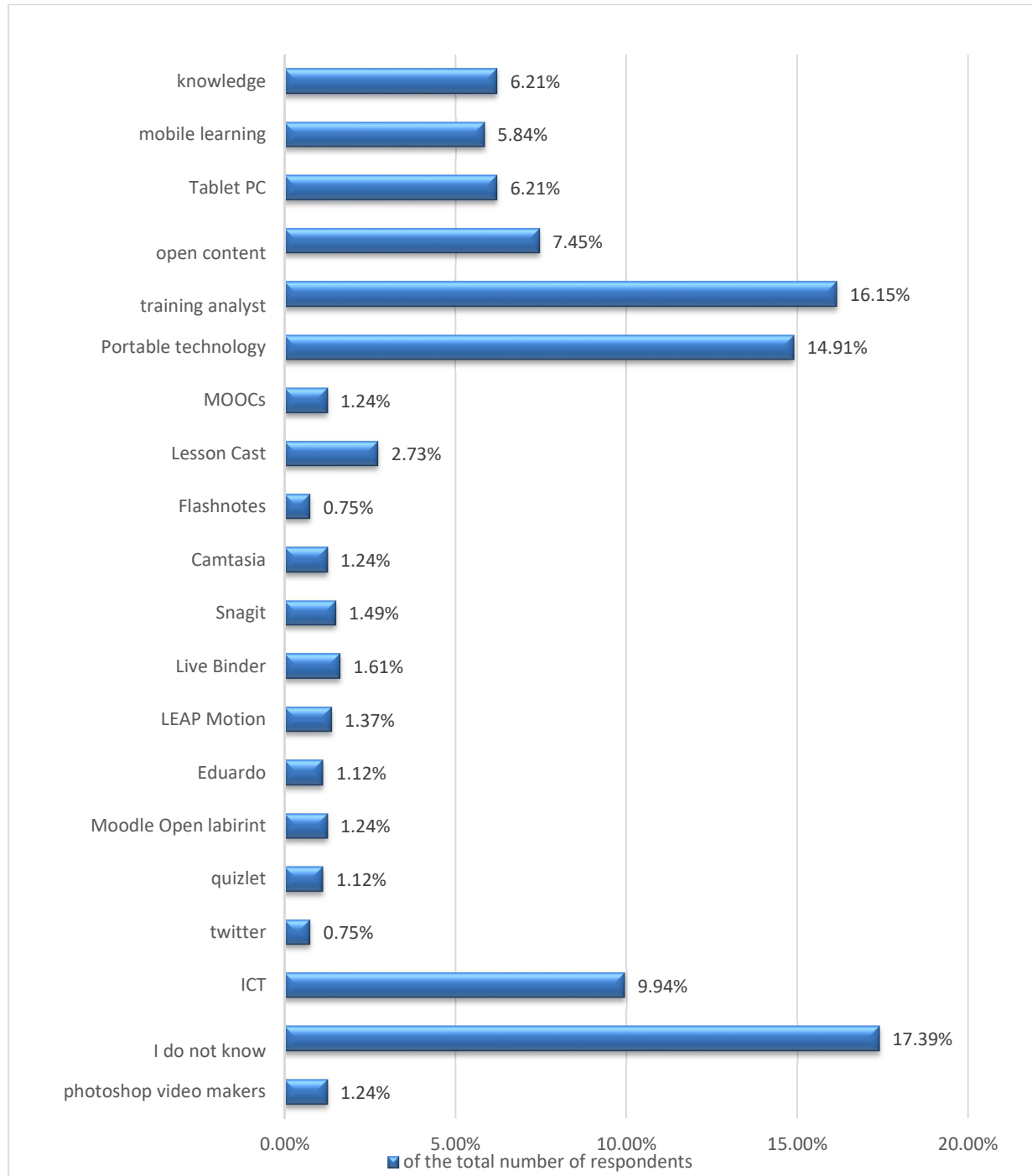The results of the answers to the question are shown in figure 6.

Figure 6. Frequency of answers to the question "What educational technologies do you use?»

The most frequently noted, as in the previous question, is the answer training analyst (16.15%), followed by portable technologies (14.91%). Also among the most common answers, (there are 10 of them): knowledge (6.21%), mobile learning 5.84%, tablet computer (6.21%), virtual and remote laboratory, open content and training Analytics, games and gamification, portable technologies, cloud computing etc. Respondents are less used Twitter, Moodle and Open Labyrinth, flash notes and some others. But shocking is, that many have answered this question with an "I do not know" (17.39%).

Question 8. Which of these technologies proved to be the best in your opinion? Why?

The answers to this question show, that teachers and students are well versed in the advantages of a particular educational technology. Preference is given to mobile learning, which is the opinion of respondents, allows students to think independently, looks for the necessary information, process it, identify the problem, analyze the experience and knowledge, gives the opportunity to study in other Universities and gain new experience. According to students, open content, because even if they miss classes, they will be able to independently study the material. At the same time respondents think, that "Open content", "ICT" and "Tablet PC" will be more useful in education.

Question 9. Are students Involved in the process of finding new teaching methods and introducing new technologies at your University?

Based on this figure 7, we can conclude, that the opinions of teachers and students on this issue are the same. As shown in the graph, students are not always involved in the development and search for a new educational method. Only 45.96% of respondents participate in this process and 44.10% do not. In the category of other answers were "I do not know", "I cannot answer", "all" and even "through Advisory bodies" (9.94%), as well as missing lines.

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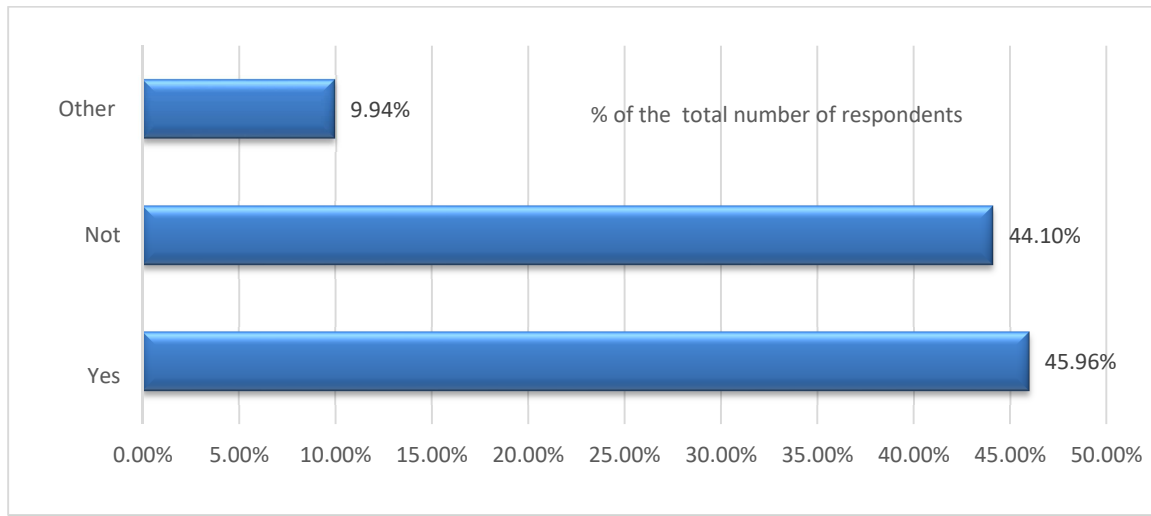
Figure 7. Results of the answers to the question "Do students participate in the process of finding new teaching methods and introducing new technologies at your University?"

2.3. Quality of the Teacher

Question 10. What do you think makes the lecturer innovative?".
The results are shown in figure 8.

In response to the question "What do You think makes the lecturer innovative?" 18.63% of the respondents said that creativity, 14.91% the ability to simulte, 12.43 Innovation, 10.43% providing students the opportunity that are relevant to their lives and future, 7.45% - to provide students an innovative and stimulating environment.

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% of the total number of respondents

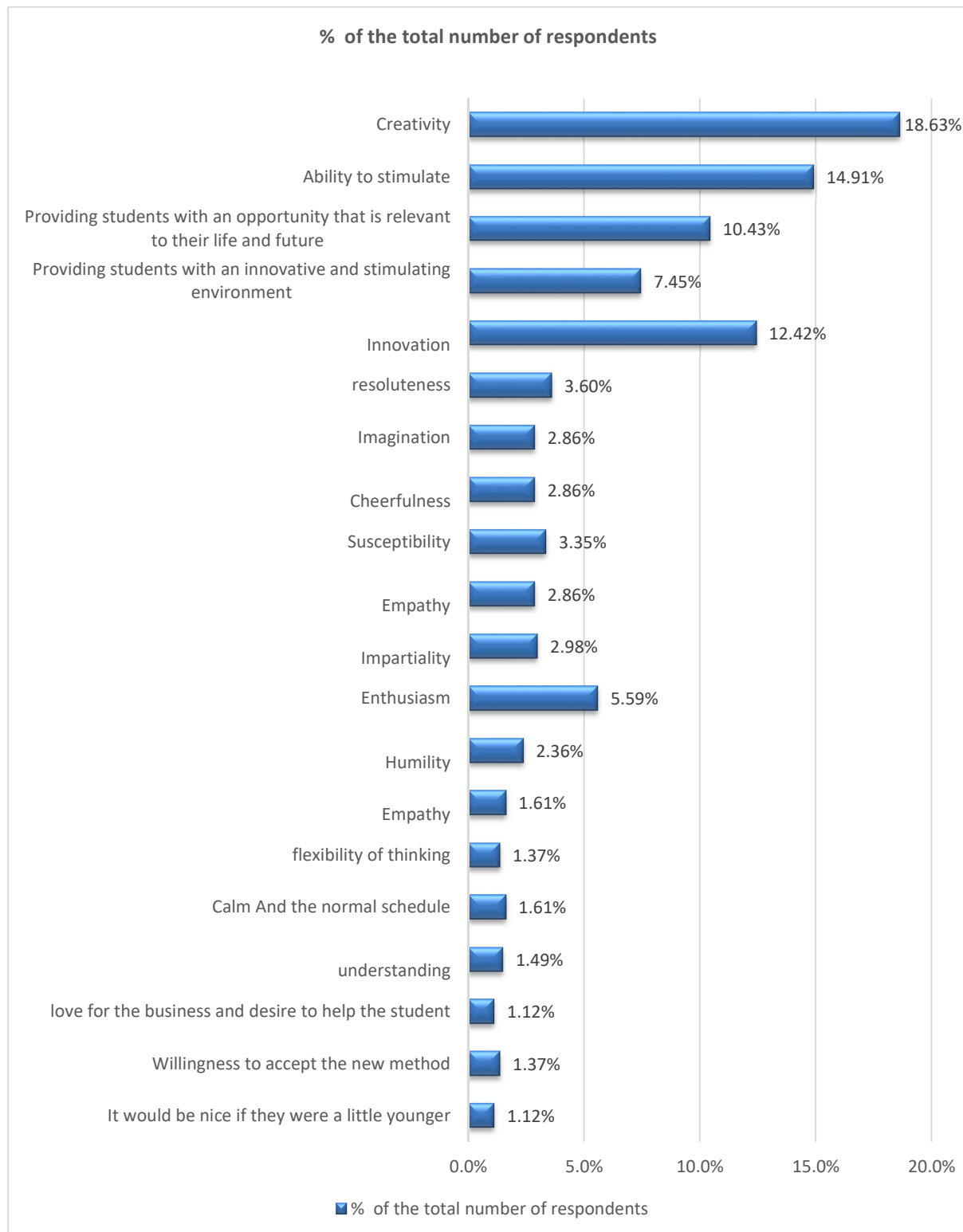| Category	%
Creativity	18.63%
Ability to stimulate	14.91%
Providing students with an opportunity that is relevant to their life and future	10.43%
Providing students with an innovative and stimulating environment	7.45%
Innovation	12.42%
resoluteness	3.60%
Imagination	2.86%
Cheerfulness	2.86%
Susceptibility	3.35%
Empathy	2.86%
Impartiality	2.98%
Enthusiasm	5.59%
Humility	2.36%
Empathy	1.61%
flexibility of thinking	1.37%
Calm And the normal schedule	1.61%
understanding	1.49%
love for the business and desire to help the student	1.12%
Willingness to accept the new method	1.37%
It would be nice if they were a little younger	1.12%

■ % of the total number of respondents

**Figure 8.Results of the answers to the question "How do you think, what
makes the lecturer innovative?"**

Question 11. What qualities do lecturers / teachers need to teach 21st century students?

The results are shown in figure 9.

The necessary qualities required for lecturers/teachers to teach students in the 21st century are marked by decreasing qualities such as: creativity (12.80%), Innovation (12.42%), providing students with an opportunity that is relevant to their life and future (9.44 %), providing students with an innovative stimulating environment (7.08 %), determination (8.07%), Love to work (6.21%), flexibility of thinking (7.70 %),
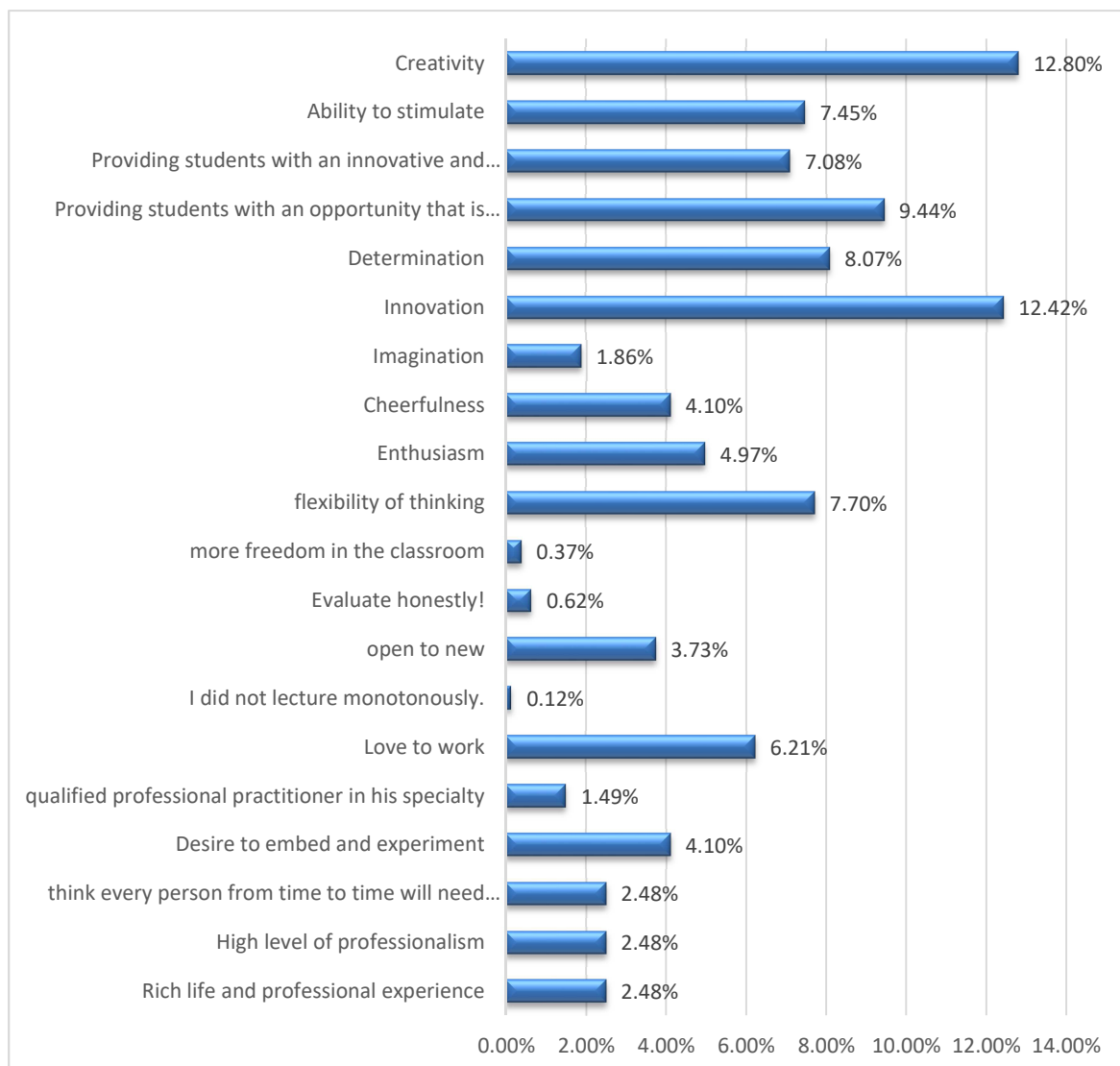

Figure 9 Results of the answers to the question "How do you think, what makes the lecturer innovative?"

2.4.   Status of Innovative Learning in Higher Education Classes;

Question 12. How do you think the current level of education today? Is it innovative enough?

The analysis showed that now the level of education in the country is now at an average level.

To question "12. How do you think the current level of education today? Is it innovative enough? Respondents believe that because every student has access to any information, in our time the ways of obtaining knowledge are quite innovative. But not always a large amount of information is reliable. Improvements in the relevance of knowledge are required. However, a larger number of respondents note that the level of education needs to be improved, digitalization and introduction of distance learning technologies are necessary. The answers of respondents showed that now it is at average level (17.14% and 16.15%).
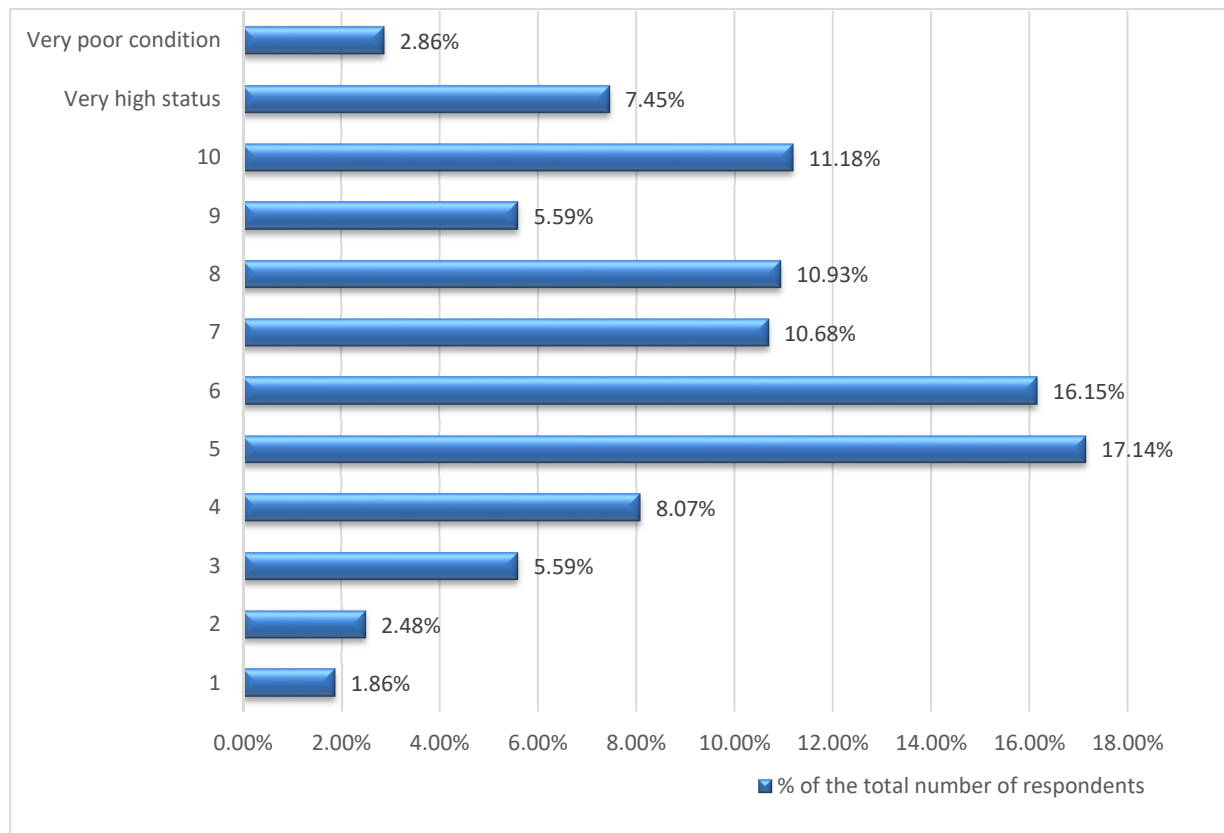

Figure 10. How do you think the current level of education today? Is it innovative enough?"

2.5. Quality Assurance of Teaching and Learning

Question 13. Do You allow your students to rate your lectures?

The survey shows that the majority of teachers (62,24 % of the total number of respondents) allow their students to evaluate lectures (figure 11).
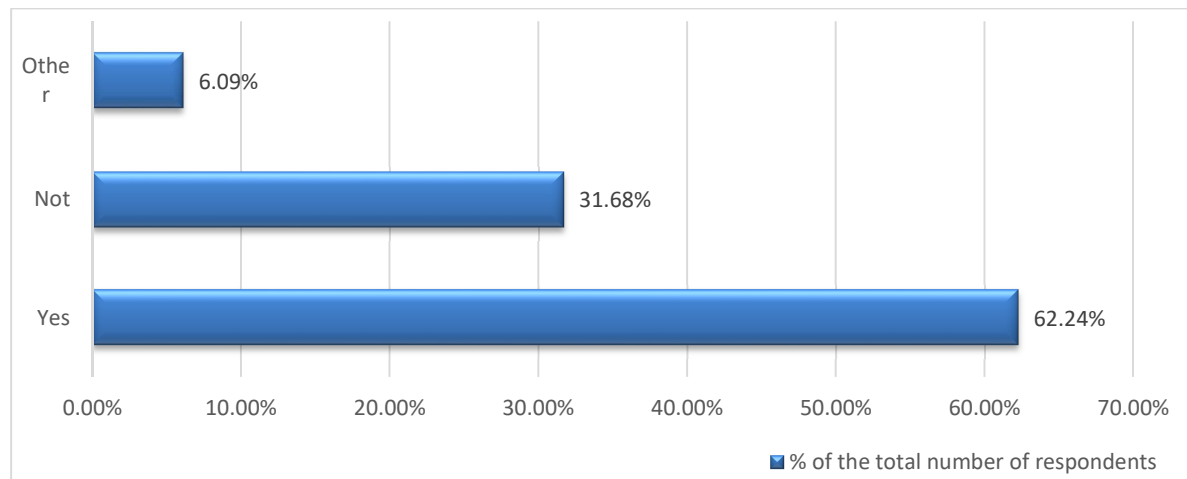
Figure 11. Analysis of these answers to the question "Do You allow your students to rate your lectures?"

Question 14. What tools / methods do you use to do this if the answer to question 13 is yes?

Part of the respondents-lecturers say that in order to obtain feedback and improve the educational process they evaluate their classes by talking, questioning, reflection and expert evaluation method. More often, the assessment of classes of teachers by students is carried out in the course of a survey conducted at the University level.

Question 15. The question is "What teaching methods do students complain about the most, which are used in your University?"

Most respondents found it difficult to answer. Students note that lectures held in the format of "monologue" are ineffective; rewriting the material takes a long time.

Question 16. What are the criteria for evaluating teachers at your University?

In many of the questionnaires, respondents indicated that constant polls are being conducted and a rating is being displayed among teachers at the University-level.

Question 17. Do you use any innovative methods of feedback (survey, Google forms, etc.)? If yes, please specify.

Unfortunately, manual information collection is still ongoing. Only 20% of respondents said they use Google forms. The rest answered that they create questionnaires and conduct a survey manually.

Question 18. Do you think that the current training program for lecturers in your country meets the needs of modern schools and universities?

The majority of respondents (49.69%) believe that the current training program for lecturers in Tajikistan meets the needs of modern schools and Universities but also 40.99% answered that it does not do so (Figure 12).
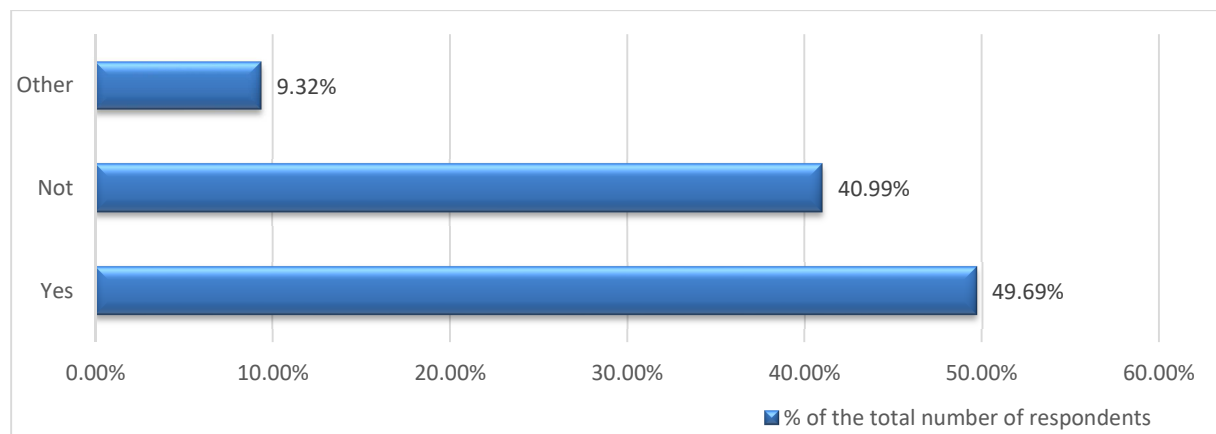

Figure 12. Analysis of the response data to the question "Do you think that the current program of lecturers in your country meets the needs of modern schools and universities?"

2.6. Continuous Professional Development of Teachers

Question 19. What are you doing to improve your skills in teaching methods?

Teachers mainly improve their skills in teaching methods through advanced training courses, and online training (40.99% of respondents), reading scientific articles about new teaching methods (6.21%), attending classes of colleagues (6.96%), analyzing the results of a student survey (6.21%) (Figure 13). Great importance was also noted in "improving the skills of teaching" and "the role of mentoring" (29.2%). "Improve the skills and participation of teachers in professional networks" (24.6%), in Erasmus + programs (22.7%).

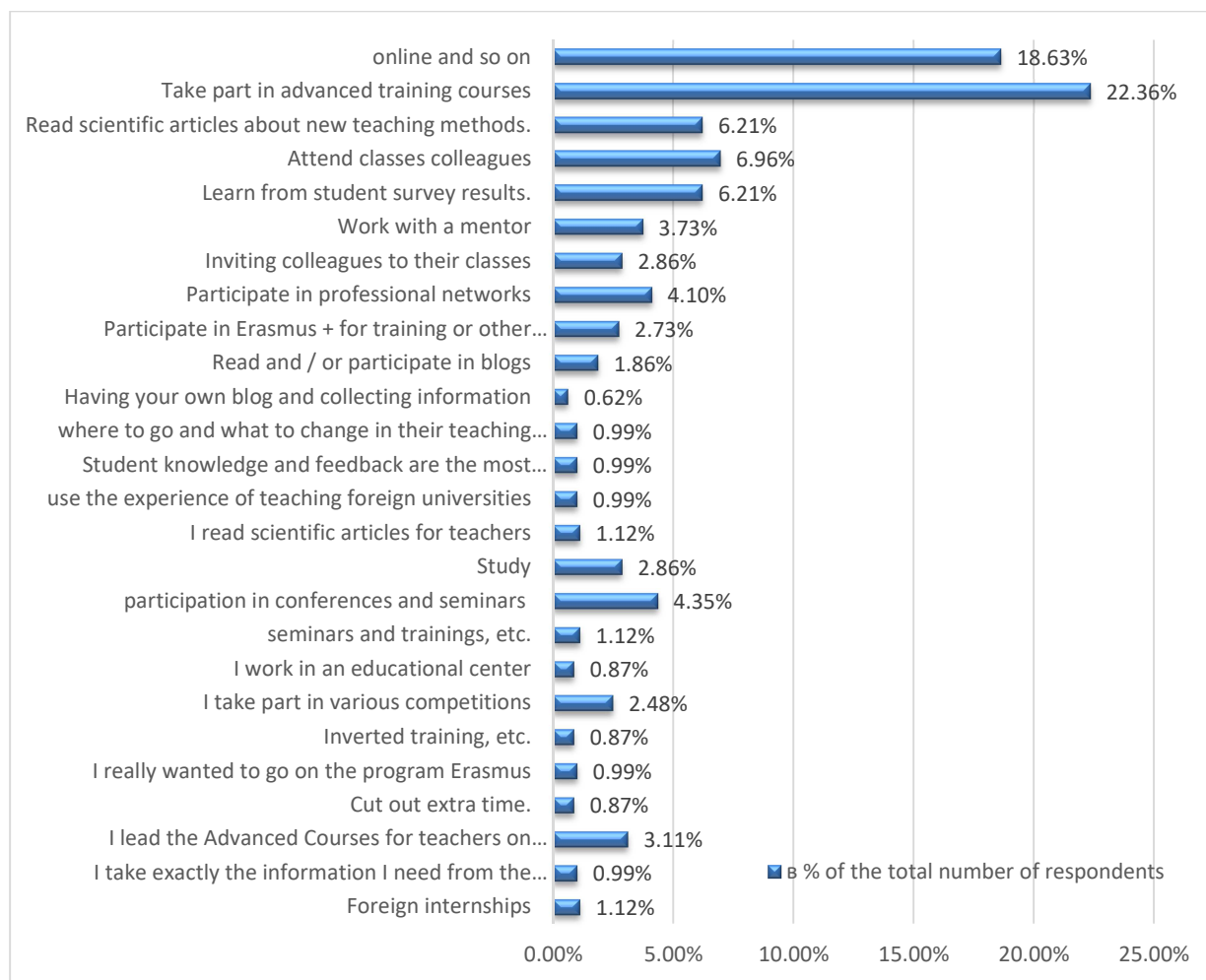At the same time the less % take students feedback, taking information from Internet, etc.

online and so on	18.63%
Take part in advanced training courses	22.36%
Read scientific articles about new teaching methods.	6.21%
Attend classes colleagues	6.96%
Learn from student survey results.	6.21%
Work with a mentor	3.73%
Inviting colleagues to their classes	2.86%
Participate in professional networks	4.10%
Participate in Erasmus + for training or other…	2.73%
Read and / or participate in blogs	1.86%
Having your own blog and collecting information	0.62%
where to go and what to change in their teaching…	0.99%
Student knowledge and feedback are the most…	0.99%
use the experience of teaching foreign universities	0.99%
I read scientific articles for teachers	1.12%
Study	2.86%
participation in conferences and seminars	4.35%
seminars and trainings, etc.	1.12%
I work in an educational center	0.87%
I take part in various competitions	2.48%
Inverted training, etc.	0.87%
I really wanted to go on the program Erasmus	0.99%
Cut out extra time.	0.87%
I lead the Advanced Courses for teachers on…	3.11%
I take exactly the information I need from the…	0.99%
Foreign internships	1.12%

в % of the total number of respondents

0.00%   5.00%   10.00%   15.00%   20.00%   25.00%

Figure 13. The question "What are you doing to improve your skills in teaching methods?"

3. Summary

The survey was conducted both with the help of a questionnaire in the Google-survey system in Russian, and manually with the help of questionnaires printed in Russian and Tajik languages.

805 people from 23 Universities of the Republic of Tajikistan responded to this survey.

The survey showed that the use of innovative technologies in education is an important part of the educational process, both for teachers and for students. Both students and teachers showed a high interest in innovations in the educational system. Some answers in the questionnaire were previously not familiar to some respondents, but in turn, the survey provided an incentive to think about new innovative approaches in education. Students need to be involved in the learning process, give a teacher a lecture, discuss the new teaching knowledge in teaching, to attract interest in the discipline, improve the quality of learning gained. Based on the survey, the following technologies and teaching methods can be identified: the use of what should be paid attention to, determine the relevance and need for teaching and teaching specific disciplines: the use of active teaching methods, the use of virtual manipulators, participation in online training, the use of video for mini-lessons; using an interactive learning model; providing models of life situations, using role-playing games, problem-solving. Dominance of any participant of educational process or any idea is excluded. The listed technologies and teaching methods are not widely used at present, but they are of interest for both, the teaching staff and students.

It is gratifying that many students and teachers are ready for changes and are ready to assist in their implementation in the educational process.

4. Recommendations

Based on the survey, we consider it necessary to provide some recommendations for managers and subjects of education of the Republic of Tajikistan.

Recommendations related to changes in the structure of teaching and learning in higher education institutions.

In higher education institutions it is necessary:

➢ Attract teachers to use the potential of new learning technologies. To consider the possibility of using intercollegiate cooperation to improve students' choice and quality (and, possibly, reduce costs).

➢ Foster an institutional culture of innovation that enhances creativity, provides awareness of the benefits of innovation, stimulates openness to innovation, and minimizes resistance to change.

➢ To consider the possibility of encouraging and encouraging university staff for the development and implementation of digital educational resources and technologies in the educational process;

➢ Take adequate measures to develop the skills of the teaching staff, as well as to cooperate more closely for the performance of teaching functions.

➢ Check existing organizational constraints and relationships.

For The Ministry of Education and Science of the Republic of Tajikistan:

The Ministry of Education and Science can:

➢ Assist in establishing a clear legal and regulatory framework to remove obstacles that universities may face in the field of online education, including: inadequate mechanisms for ensuring quality, lack of credit recognition processes and regulation of intellectual property rights.

➢ To promote the creation of a national network of innovative educational technology centers, digital educational resources.

➢ Providing support for internal and external student mobility.

➢ To promote the creation of a national network of innovative educational technology centers, digital educational resources.

Recommendations regarding technology and student achievement in higher education:

Higher education institutions should consider the need to:

➢ Build supportive relationships and trust between relevant actors (students, teachers, support staff, IT professionals, managers, and employers, where applicable).

➢ Identify any unintended consequences of innovation (for example, for other functions, for increasing participation or connections in the labor market).

- ➤ Determining the (diverse) needs and circumstances of the trainees;
- ➤ Ensuring access to relevant technologies and mastering the necessary skills in order to extract the maximum benefit from them.
- ➤ Recognizing that the successful implementation of learning analytics will depend not only on the choice of technology, but also on making the necessary institutional changes needed by teachers, IT professionals and administrators to work together effectively to support students.
- ➤ Providing appropriate processes, tools and supporting actions so that faculty can make full use of the full-fledged data obtained using analytics tools for timely response to the individual needs of students and the further development of the teaching process.
- ➤ Clarification of the roles of the various participants (both inside and outside the institution) involved in meeting the needs of Universities;
- ➤ Providing a collective understanding of the various roles / responsibilities and relationships among the participants.
- ➤ Provide clear limits on management responsibility and information requirements for performance evaluation.
- ➤ Balancing commercial, educational and reputational considerations when developing a common international strategy.
- ➤ Considering a number of interrelated factors, such as student mobility (internal and external), student placement, recognition of qualifications, financial implications, curricula and pedagogical implications, as well as links in the labor market.
- ➤ Addressing the needs of various stakeholders, including domestic and foreign students, academic and support staff, quality assurance agencies, employers, and sponsoring agencies.
- ➤ Attracting employees of a local university and building relationships between employees of different partner Universities.
- ➤ Definitions of what experience to share with foreign universities and how to reflect local situational factors in different Universities.
- ➤ Definitions of what to learn from international experience in order to make changes in your University.
- ➤ Meet different national regulatory and quality assurance regimes.
- ➤ Development of guidelines for the introduction and use of innovative educational technologies in different areas of study.
- ➤ Equipping the common areas of universities with interactive information screens, which will provide basic information about the academic, educational and international processes at the university.

➢ Creation of virtual laboratories for engineering disciplines.
➢ Creation of the "Evaluation form of innovation" page on the web pages of universities where students will be able to evaluate one or another lecture / course, thereby introducing a rating among teachers.