

MOOC Introduction into Educational Process: Experience of On-Line Courses Integration in University Educational Programs

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Abstract

The article presents the results of a study on the introduction of mass open online courses into educational programs of the Belgorod State National Research University. Open education technologies make it possible to implement the principle of constructing an educational process at a higher educational institution with a student focus on its features and requests for education. The integration of online courses into the university's educational programs was based solely on an e-learning model using an online course. The task of integrating online courses in the educational process, which was solved in our study, was to expand the possibilities of full-time study, optimize labor costs for the implementation of educational programs, and ensure the "digital" interaction of participants in the educational process. Phased mastering of the subject gave students the opportunity to understand the material better before moving on to topics that are more complex. Assignments for mutual testing allowed students to evaluate assignments of "fellow students" because of which material was repeated, which also had a beneficial effect on the learning outcome. The results of the study allowed to determine the degree of adaptation of students to the new format of the educational process, student satisfaction with the organization of learning using the MOOC, to analyze the quality of student learning. The results of the study allowed to determine the degree of adaptation of students to the new format of the educational process,

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to identify students' satisfaction with the organization of learning using the MOOC, to analyze the quality of knowledge gained by students studying with the MOOC format, compared to the quality of knowledge obtained by students studying the discipline in the traditional form.

1 Introduction

In modern society, the main direction of modernization of the traditional education system is the use of digital educational technologies, which include e-learning and distance learning technologies. Recently, the main trend in the development of education is the use of open online education technologies in the educational process, as a new form of implementing distance education technologies based primarily on the use of mass open online courses (MOOC) [Wei19, Ton18, Gal18, Krya18, Gol, 17, Tre16].

MOO offers intensive study of material in a short time, the possibility of choosing an individual learning path and a teacher, getting the most interesting and sought-after courses from different universities of the world, as well as low cost. The massive open online course is an information and educational environment accessible to everyone through the Internet. In addition to high-quality content, presented, as a rule, in the form of a training video, supplemented by presentations and text material, the MOO contains tasks for self-examination, control tasks for sections and tasks for final control [Tit16, Lin18]. The environment is designed in such a way that it allows you to check tasks in automatic mode (tests, tasks for mutual testing, virtual simulators, etc.), which makes it possible to study simultaneously thousands and even tens of thousands of people. In this case, the "presence" of teachers in the course is minimal. The interaction of participants in the educational process is carried out in the framework of forums that help create and support communities of students, teachers and teaching assistants. [Coh19, Bel18, Roshch18].

In the international educational space, MOO has already become a popular way for students to learn both individual courses and entire specializations. Currently, more than 900 universities around the world have created at least one MOOC. In total, more than 11,000 online courses have been posted on open education portals, and about 2,000 of them appeared in 2018. Almost all European universities, one way or another, use e-learning technologies in their work. The overwhelming numbers of institutions use the blended learning model (when the study of material and practice can be carried out both within the walls of the university and at home using online technologies). Many institutions offer their students to take an online exam, even if the subject is taught in the traditional way.

The Russian educational community has recently also focused on the development of online education. On the national platform of open education and on other large platforms of the federal scale, hundreds of thousands of students, applicants, and students are currently studying. Many leading universities in Russia have already developed and deployed MOO, both on Russian and international platforms, and are actively using the technology of mass open online education in the educational process. All leading universities have established structures involved in the development and use of the MOO, with dozens of employees.

The introduction of massive open online courses in the educational process is quite a difficult task, coupled with a number of transformations, both at the university level and at the level of individual employees who are directly involved in the process of integrating online courses into the educational program. This includes the development of regulatory documents governing all aspects of online learning, the need to redesign Basic Education Programs and Work Programs of Disciplines, the need to implement some organizational activities, and prepare students for a new format for studying disciplines and much more.

Since 2018, the Belgorod State National Research University (NRU "BelSU") has been implementing a program for developing online education, the aim of which is to improve the quality of teaching, the degree of accessibility, openness, variability and attractiveness of educational programs of the university by introducing modern innovative technologies into the educational process online learning. In 2018, the open education portal of Open Belarus State University (open.bs.u.edu.ru) was created, and in the beginning of 2019, Open Belarus State University was presented on a single-window resource (Modern Digital Educational Environment of the Russian Federation (online.edu.ru)). The portal was created based on The OpenedX Open Source Course Management System (CMS) platform developed by MIT and Harvard, which is used worldwide for mass open online courses. In Russia, the OpenedX created the National Open Education Platform; MOO-portals of leading universities of the Russian Federation on the open education portal the first Belgorod mass open online courses "Fundamentals of Project Management" and "Russian as a Foreign Language (Elementary Level)" were posted. Students have used the online courses and students of Belgorod State University since September 2018 and now they have

passed the quality assessment Platforms and DSPs are available to everyone in a single window resource.

2 Goal Setting

One of the main tasks of the online education development program at NRU "BelSU" is the introduction of new learning models into the educational process, based on the use of modern distance and blended learning technologies, including using online courses. Development by leading teachers and scientists of the National Research University "BelSU" MOOC and their placement on its own and Russian open education portals contributes to: promoting the university brand; selecting and searching for talented students and expanding their "geography"; development of innovative pedagogy, based on modern digital technologies and on the principles of individualization of education and, as a consequence, improving the quality of the educational process, etc.

Therefore, the purpose of this study was to test a model of the organization of the educational process using the MOOC in the implementation of the discipline "Fundamentals of Project Management". Teaching students, regardless of their direction, the basics of project management is an important task of modern society. The organization of project activities of students contributes to the ability to self-determination and goal-setting, the development of creative abilities, helps to navigate the information space [Zak17, Kar18]. In the process of mastering the discipline, students studied video lectures with subsequent answers to questions for self-examination and discussion on the forum; carried out training tasks for each topic of the course; carried out a phased preparation of the final project; performed final control testing. During the study, we needed to determine the degree of adaptation of students to the new format of the educational process, students' satisfaction with the organization of learning using the MOOC, and also to analyze the quality of training in the discipline in order to confirm the correctness of applying the e-learning model using the online course.

3 Method's Preparation

The methodological basis was the study of both domestic and foreign scientists in the field of online learning educational technologies [Cor19, Roshch18, Ste13, Tim17], new forms of organizing the educational process using open online courses [Kria18, Gol17, Tre16], problems of teaching staff readiness to the introduction of digital pedagogy into educational institutions [Ape16].

In the theory of the issue, we studied the existing models of using MOOCs in the implementation of higher education programs [Nau19, Met19, Sem17]. In this study, we analyzed regulatory legal acts in the field of implementation of the educational process using online courses developed both in Russian and foreign universities. Based on global experience, and in order to implement the educational process with a high level of individualization, optimize the workload of the teaching staff and provide students with the skills of educational and cognitive activity using modern online technologies Belgorod National Research University has developed a regulatory framework (Regulations on the procedure for applying e-learning, distance learning technologies in the implementation of educational programs at the BelSU National Research University; Rules for implementing the educational process using online courses).

The introduction of online learning technologies into the educational process of the university was carried out on the basis of its own MOOC "Fundamentals of Project Management", developed by teachers of the Department of Management and Marketing at the Institute of Economics and Management of the Belgorod State National Research University. MOOC "Fundamentals of Project Management" was integrated into the educational programs of the university exclusively on the model "Exclusively e-learning using online course." This model assumes the implementation of the educational process exclusively in the MOOC environment. The online course dealt with key concepts and areas of project management knowledge. To prepare students for the new form of organization of the educational process, a classroom orientation lesson was held, which reviewed organizational issues, presented an open education portal interface, course structure, organization of intermediate and final certification for the course. During the semester, the teachers of the discipline accompanied the educational process implemented in the MOOC format: answered the students' questions in the forums; conducted a weekly analysis of the dynamics of students' learning (progress); sent out motivational messages, etc. Final testing was conducted in computer classrooms under the supervision of teachers (no external proctor was required) (Fig. 1).

4 Results

The study of the results of the introduction of online courses in the educational process of the BelSU National Research University was carried out based on observations, of the analysis of students' personal data participating

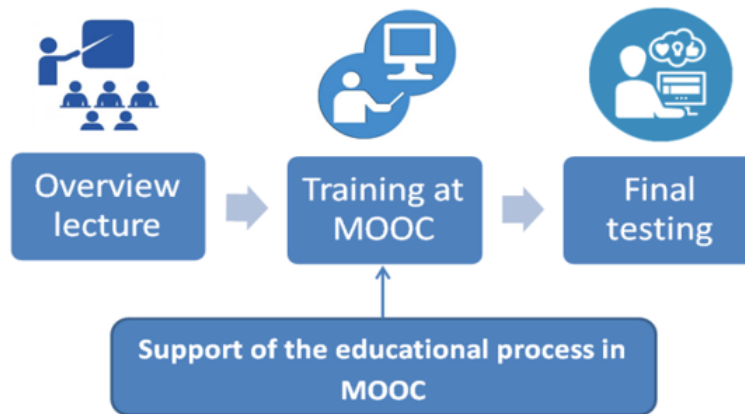


Figure 1: Model of using MOOC for the implementation of the discipline "Fundamentals of project management"

in this process, the results of knowledge test. 112 3-year students of the BelSU institutes participated in the survey on the integrated MOOC educational programs: 75 (67%) students from the social sciences and social sciences and mass communications - 37 (33%) students. Processing the questionnaires allowed us to draw some rather interesting conclusions. Of the 112 respondents who filled out the questionnaires, 75 people (67%) rated this course as optimal in complexity, and 22 people (19%) found this course rather difficult and 3 people (3%) too difficult (Fig. 2). However, when evaluating the weekly load in hours that students spent on mastering course materials (watching video lectures, completing assignments, testing, reading additional materials, etc.), most respondents rated it as optimal (86 people or 77%) 3).

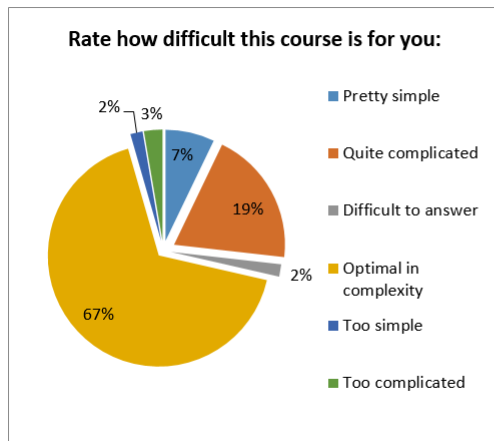


Figure 2: Evaluation of the complexity of the online course

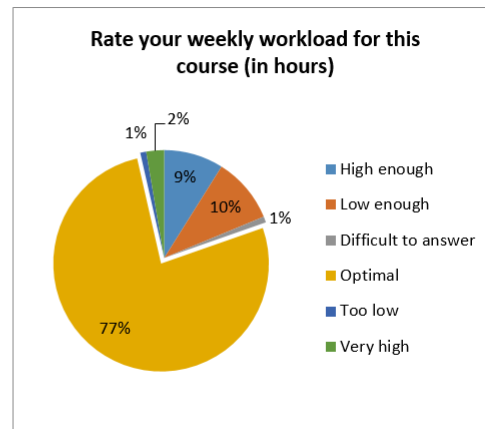


Figure 3: Evaluation of the weekly load in the online course.

This is evidenced by the average number of hours that students spent on mastering the material at the rate (2-4 hours per week) (Fig. 4). Perhaps those who spent more than 6 hours per week studying the material found the weekly load quite high - 9 % of respondents or very high - 2%. But there were those who spent 1 hour or less for studying the course materials and the weekly load on the course seemed to be quite low (8 people - 7%) or too low - 1%.

The analysis of the degree of satisfaction with the elements of the course by the students, the content of the course on a scale from 1 to 5 (where "1" is absolutely not satisfied (s), "5" is completely satisfied (s)) draws our attention to the effectiveness of certain elements in of the course and shows that the majority of students were satisfied with the course content (depth of content, scope, logic and availability) - on average 55%, including satisfaction from video lectures received 61% of respondents, assignments - 28%, tests - 43 % and forums - 37% (Fig.5). It should be noted that when answering the question: "Have you encountered any technical difficulties on the course?", The answer of the majority of respondents (60%) was the following: "There were no technical

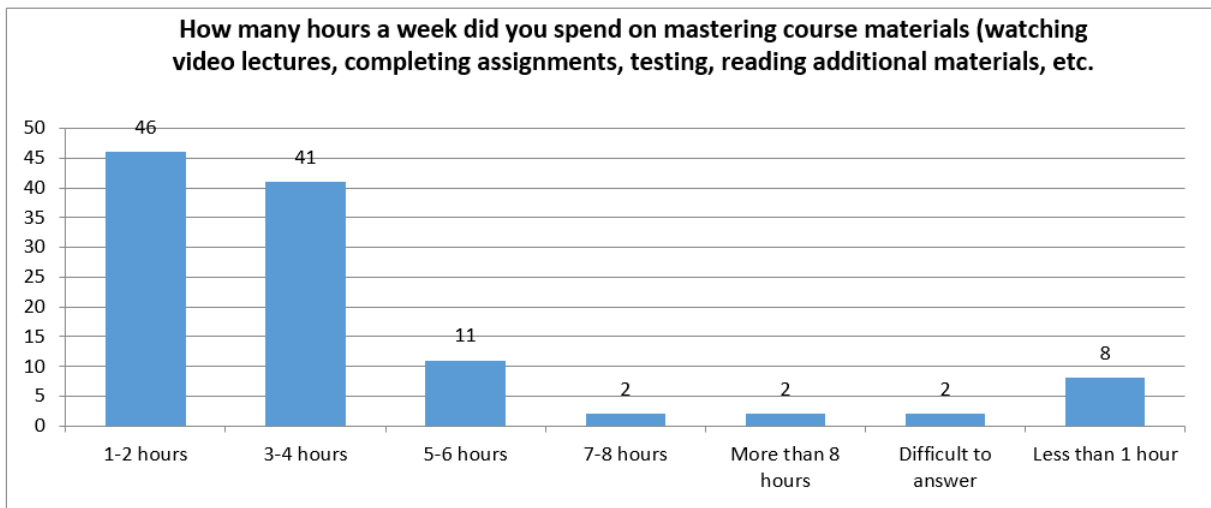


Figure 4: Analysis of the number of hours spent on studying the discipline "Basics of project management" difficulties, everything is clear and understandable", 32.7 % noted that they had difficulties in completing tasks, and 19.1% had technical difficulties in carrying out test tasks.

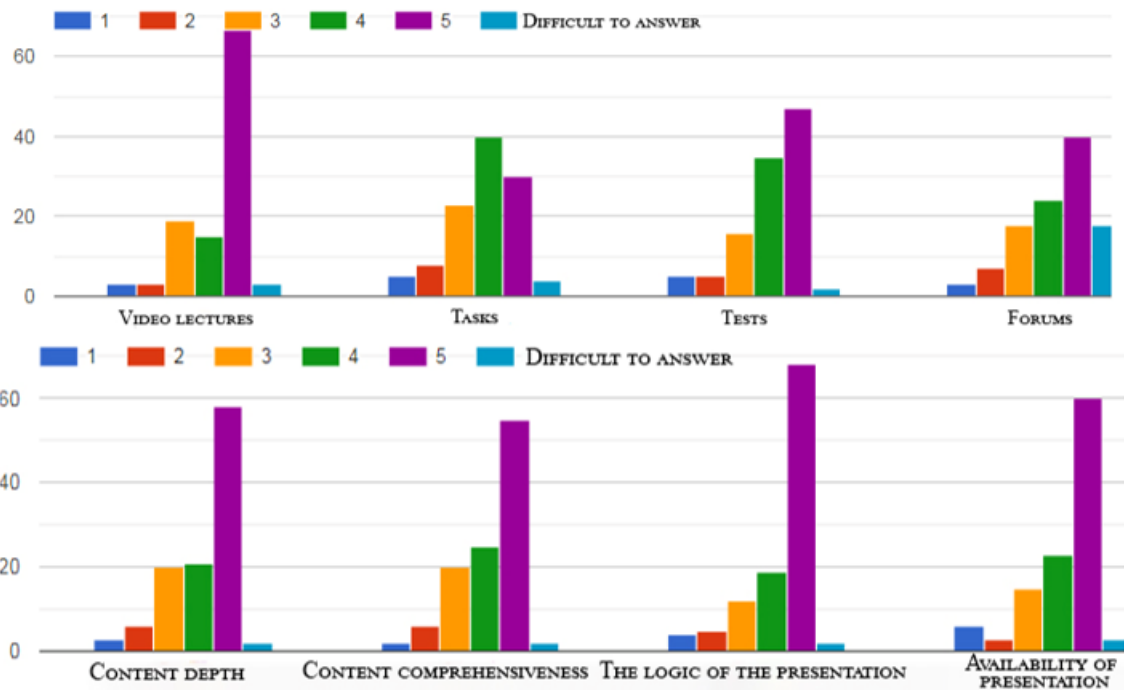


Figure 5: Degree of satisfaction with course elements and course content.

You should also pay attention to the high degree of satisfaction of students with tutoring support: from the provision of technical assistance and answers in the forum on substantive issues to quick feedback on the course - an average of 51% (Fig. 6). After analyzing the data, we can say that this is a fairly high figure, which indicates a good tutoring course support and quick resolution of any issues that students need while studying on an online course.

Quite interesting results were obtained when analyzing students' responses of the following statements: "I liked the format of massive open online courses" - 46% of respondents fully agreed with this statement, 23% more likely agreed with this statement, 16% rather did not like and 9% absolutely not I liked this format for studying disciplines. The statement "I didn't have enough time to study this course" was presented by different answers, but 30% of them did not agree with this statement, 20%, on the contrary, agreed with this statement and found that they did not have much time to study online course Of the remaining answers, 22% considered that they

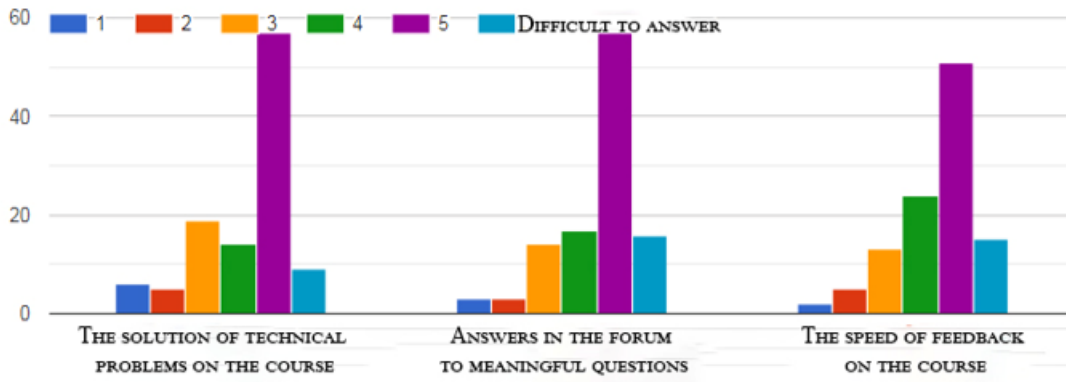


Figure 6: The degree of satisfaction of students with tutor support of the course.

rather agreed with this statement than not, and 14% rather disagreed, 14% found it difficult to choose an answer. Moreover, for the statement “I couldn’t give enough time for the course due to employment,” the respondents’ answers were equally divided into those who absolutely agree with this statement and those who absolutely disagree 25% to 25%. Of the other answers, 15% considered that they rather agreed with this statement, 19% rather did not agree, the rest found it difficult to answer. Further, 39% of respondents did not agree with the statement that “The course turned out to be too boring,” and 16% noted this fact for themselves in their choice. 25% rather disagree with this statement, 1% agree rather than not. In this regard, we were interested in the question “What, in your opinion, should be changed in the course you have taken?”. Of these, 41.9% of respondents answered for an increase in the deadlines for completing assignments, 39.2% for posting more additional materials or references to them, 16% for decreasing topics on a course, 2.7% for increasing the course duration over time, 18% and 17.3%, respectively, read that no changes were needed or had difficulty with the answers (Fig. 7).

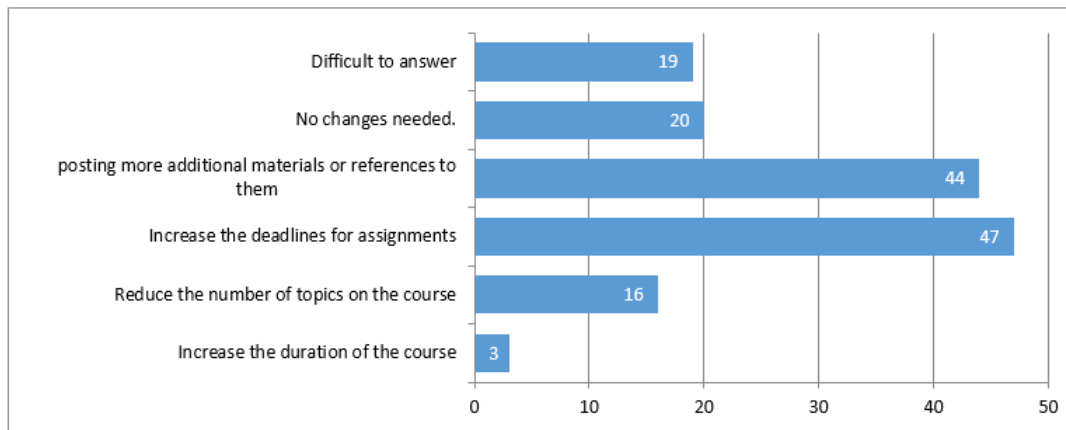


Figure 7: Wishes of students to improve the course "Fundamentals of project management"

In the student survey, we were also interested in the question: “What did you like most about the course?”. The answers were different, but most of the students pointed out in their answers: “a sufficiently detailed description and explanation of lecture topics by teachers”, “video tutorials were very accessible and clear to the beginner”, “teachers’ competence”, “the concept of free education itself, the more non-core subjects will switch to such a format - all the better”, “openness of results”, “new way of evaluating tasks”, “interesting practical tasks”, etc. To the question “What did you like least about the course?”, The answers were as follows: “tests, it is difficult to find the correct answer in lectures”, “quick lecturer speech”, “there were few references to additional materials”, “unusual conditions, there was no earlier experience of studying online disciplines, some tasks were difficult for an unprepared student of another specialty, assignment deadlines, evaluate classmates, method of grading, it would be more expedient if the assignments were checked by a teacher, etc. An interesting fact is that 35% of all respondents may have recommended their friends or acquaintances to study in this course, 16% absolutely recommended, 27% recommended, and only 11% did not recommend, and 8% absolutely did not recommend

training in this course.

We were a little surprised by the fact that only 15% are going to continue further education in the MOOC format and 33% are more likely to gather than not and only 4% were categorical in their choice and are not going to continue their education in the MOOC format, 18% found it difficult to answer, and 30% replied that they were rather not going to continue their studies in this format (Fig. 8).

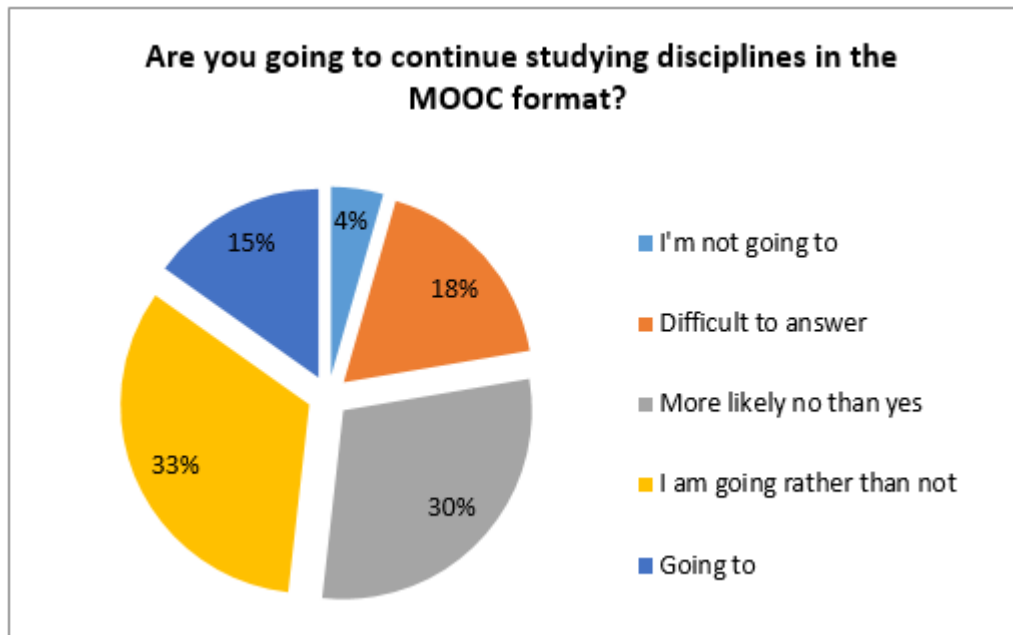


Figure 8: Wishes of students to improve the course "Fundamentals of project management"

The form of final control for the discipline "Fundamentals of Project Management" was a differentiated test, which included final testing and the implementation of creative tasks. The evaluation of students' educational achievements in the discipline "Fundamentals of Project Management" showed the high level of knowledge quality in students studying in the MOOC format (average score = 4.83 out of 5). Taking into account the control group, from among the students who studied this discipline in the traditional form of education, the average score was 4.81 out of 5. Thus, the study showed that the knowledge quality in students in higher school who study traditionally and MOOC is a little different. This conclusion is confirmed by the measurement of the central tendency in the statistical distribution of marks obtained by students at the online course in comparison with other subjects (studied in the traditional form), where the median achievement was 4.80. Based on the data, we concluded that the students positively perceived the new format of interaction with teachers in the absence of direct contact and were able to adapt well enough to online learning.

In order to improve the quality of knowledge and skills of students at the university, to form a positive attitude to the new format of online learning, further development of the approved model "Exclusively e-learning using an online course" is necessary.

5 Discussion

Analysis of the literature shows that the use of massive open online courses allows you to change the approaches to the implementation of the educational process, to complement or completely replace the traditional lecture and seminar form of organization of education. MOOC allow to increase the variability and individualization of education significantly. The mechanisms for automating educational work that are laid down in the MOOC base allow optimizing the costs of implementing educational programs, freeing up the time for teachers to spend on lectures repeated from year to year, freeing it up for more active educational practices, for engaging in methodological and scientific activities. At the same time, due to the use of high-quality digital educational resources, new modern pedagogical methods and techniques, the quality of the educational process when using the MOOC does not differ, and in the case of reasonably organized blended learning, it exceeds the quality of the traditional form of organization of education [Pro19]. The introduction of online learning models into the educational process can be an effective tool for solving the following tasks: expanding the educational opportunities offered

by the university to students, increasing the degree of individualization of education; reducing the cost of implementing educational programs in terms of traditional, ineffective forms of interaction with students; release of the classroom fund and saving material and technical resources; improving the quality of education through the use of effective online courses from leading Russian and international teachers and experts and conducting independent monitoring of students' knowledge; ensuring the rhythm of learning, the involvement of students during the entire period of study of the course through a strict system of weekly test tasks; ensuring the transparency of the content of training and, as a result, increasing confidence in the results of training. According to numerous studies, the use of MOOC-based online learning models when integrating into higher education programs (including the learning model considered in this study) enhances educational outcomes compared to an exclusively traditional teaching model [Zub18, Kra18].

From the experience of integrating online courses in higher education programs of Russian universities, we found that each educational institution decides to integrate the MOOC into the curricula at the level of each educational program separately [Ana18]. Most universities prefer to create their own MOOCs and integrate them into educational activities. In this case, to recalculate online courses it is not required to recalculate the study load, and also to assign additional measures to test the knowledge of the student.

At the Belgorod State University, teachers of the Department of Management and Marketing at the Institute of Economics and Management developed their own online course "Fundamentals of Project Management". The discipline "Fundamentals of Project Management" was added from the 2018-2019 school year to all educational programs of bachelor and specialty, with the exception of the programs of the Enlarged Group of specialties and areas of training "Economics and Management". In accordance with the curriculum, more than 1,000 third-year students should study the specified discipline. In order to expand opportunities for full-time study, optimize labor costs for the implementation of educational programs, and ensure the "digital" interaction of participants in the educational process at the university management level, it was decided to use a massive open online course when teaching this discipline. MOOC "Fundamentals of Project Management" was integrated into the educational programs of the university exclusively on the e-learning model using an online course. The online course dealt with key concepts and areas of project management knowledge. The students received new knowledge and could systematize the existing knowledge in the field of management, based on the project approach, which is currently required for successful development in any field.

The results of the MOOC integration into the educational process of the Belgorod State National Research University showed that the students were quite well adapted to the new format of the educational process and the academic performance in the subject studied was relatively high. In general, students are satisfied with the form of organization of the educational process, in which the main learning activity takes place in an online environment, and direct contact with the teacher is minimized to one installation lecture.

6 Conclusion

The results of the study allow us to conclude about the successful implementation of the MOOC "Fundamentals of Project Management" in the educational process. The use of MOOC allowed to solve a number of tasks: to unify the educational process, to reduce the subjective component in the implementation of the discipline; reduce the classroom load of teachers and students, optimize teachers' labor costs for the implementation of the educational process by replacing classroom lectures with video lectures, automating knowledge testing (tests, creative tasks for mutual testing). An important result is the experience gained by students in using modern digital educational technologies in the educational process, which will certainly be useful to them in the process of obtaining basic education and for realizing the possibility of continuing education in the future.

Students liked the e-learning environment implemented in the MOOC. The overwhelming number of students is to some extent satisfied with the quality of video lectures, tests, creative assignments, tutoring and teaching support (answers on the forum, solving technical problems, feedback speed). Students quite painlessly perceived the new format of interaction with teachers and the lack of the possibility of direct contact. Nevertheless, students experienced the most difficulties in carrying out practical tasks. The time for completing assignments was limited to strict deadlines, which is not always customary for students and in the traditional form is not always applied. In addition, in the course of performing creative tasks, students were faced with a new form of work - mutual testing and evaluation of the tasks of their fellow students.

Thus, we believe that in order to improve the educational process using the MOOC, relieve "tension" in the course of students' work on the implementation of practical tasks, we need to move from the implementation of the educational process "Exclusively e-learning using an online course" to a model close to blended learning,

adding 2-4 full-time practical lessons to the class schedule for counselling students and classroom testing of students' knowledge by a teacher. In the online course you also need to add additional materials or links to textbooks and teaching materials on the Internet and in electronic libraries.

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