Open Educational Environment as a Condition for the Development of Modern Online Learning

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Abstract

Scientists from all over the world have been dealing with the problems of developing an open educational environment for a long time. The current critical situation due to the mass transformation to distance learning has certainly influenced the process of creating or updating universities' open educational environments. However, the education system tends to develop online learning, increase online bachelor's and master's degree programs, training programs, etc. Consequently, it becomes obvious that modern online learning should be implemented under specific conditions, thereby creating a unique open online educational environment. It is very important to solve the problem of organizing qualitative online learning when developing such an environment. This is facilitated by the use of the latest digital and pedagogical technologies, for example, business simulators. One of the tools for assessing the quality of online education is educational data analytics. This also helps to increase the motivation of students to study in an online environment, stimulate teachers to create qualitative content, etc. When developing an online environment, particular attention should be given to the work with teachers aimed at upgrading the level of digital competencies, mastering modern tools for organizing training sessions in an online environment, etc. Methods of both formal and non-formal education can be used in this case: training courses, webinars, the establishment of professional communities in social networks, etc. This article presents the experience of the Financial university in developing an open educational environment. The purpose of the study was to analyze different cases of conducting students' educational events. The authors also include recommendations for organizing qualitative online learning.

Keywords [1]
Open educational environment, online learning, event pedagogy, simulators, LMS Moodle.

1. Introduction

Currently, there is a consistent expansion of ideas about the territory where educational processes unfold: from a specific, limited by physical boundaries (walls) of the place where they teach and study, to a global open information and educational environment of the modern world. This has become especially noticeable when the global pandemic caused the mass transition to distance learning.

The term of an open educational environment is considered today as a global background for intercultural interaction and free movement of the participants of the educational process. Also with the diversity of the quality of the national and regional educational environment, there is a widespread movement towards such general characteristics as openness, diversity, inclusiveness, multileveled, poly structure [11].

The development of open education is due to some reasons:

- transformation of the whole education system associated with the digitalization of society;
- the opportunity to get an education for young people who, for various reasons, are unable to participate in face-to-face learning;
- obtaining additional professional education by specialists of any age [7].

The problems of "open education" abroad began to be actively engaged in the last third of the XX century, and in the Post-Soviet space at the beginning of 2000.

From a methodological point of view, researchers of the problem of open education have different positions: some take a personality-oriented approach as a basis and consider open education in the context of a humanistic paradigm; others associate a new educational paradigm with cultural and axiological approaches; still others take the methodology of synergy as a basis, consider education as an open, creative process that promotes the teacher's free choice of forms and methods of teaching, and students – an individual educational trajectory, in the process of mastering which there is an open dialogue and cooperation with the educator.

In the educational-methodical and pedagogical literature, the terms "open education" and "online education (learning)" are considered by some authors as close in meaning, while others as indicating different phenomena in education.

V. O. Zinchenko understands the open educational environment as a system of relations between the participants of the educational process, implemented through their interaction with various social institutions to development of the potential of the student's personality, which implies the development of a consciously chosen educational trajectory, the main element of which is information about the culture of humanity [12].

From January 2014 to June 2019, a systematic review of 245 articles on the topic of open education was conducted in the Web of Science (WOS) and Scopus databases. The analysis included four topics: general characteristics of publications; identification of methodological trends; identification of central and related aspects of the topic; implemented innovative educational practices. As a result, the following conclusions were made:

1. Open education for all. Studies on open education published in recent years show not only quantitative but also qualitative growth, mainly in developed countries. Open education is based on the form of qualitative content and makes the problem of access to materials in languages other than English obvious. An important opportunity is opening in developing countries, where this type of open education can facilitate access to qualitative knowledge.

2. Open education with mixed empirical data. Methodological trends, strategies, and tools accompanying the research of open education indicate a quantitative and qualitative trend. Working with mixed methods allows getting closer to the knowledge of complex aspects. Open education faces the problem of a holistic and interdisciplinary understanding, which involves some changes in the methods of researching education.

3. Open education of co-creation and quality. The practice of open education has advanced in its pedagogical and technological perspectives and faces problems related to the aspects of cooperation and quality. There is a need to make academic research more accessible. Collaborative and creative work will help the field of open education to ensure wider enrichment based on qualitative teaching methods.

4. Open education for innovation in the field of mobilization, integration, and diversity. The Open education movement promotes methods of production and distribution, and it is also faced with the task of introducing innovative methods of mobilization that affect the learning environment. The task is to integrate open practices into education. UNESCO's recommendations call for comprehensive and equitable access and the promotion of international cooperation [5].

Thus, the problems caused by global crises, such as the pandemic situation due to COVID-19, require the cooperation of all participants to create an open innovative educational environment that is inclusive (with open resources and practices that support education for people with special needs or disadvantaged groups of the population) and diverse (with open materials in different languages with cultural and gender relevance).

2. Presentation of the Basic Material

The development of an open educational environment in the implementation of online bachelor's and master's degree programs has its characteristics and limitations. In this article, the authors present the experience of the Institute of Online Education of the Financial University in developing an open educational environment.

Now, the situation with the pandemic has outlined a tendency to clearly distinguish between elite and mass education. In our opinion, elite education in the future will be implemented on the campus, using digital technologies, according to various models of mixed learning, for example, the well-known flipped classroom or station rotation, laboratory rotation. At the same time, the key task at the campus will be the development of the quality of education and the technologization learning process in terms of pedagogical technologies and their integration with digital technologies. Another characteristic of elite education will be guaranteed employment and career development and, possibly, post-program support for working with graduates (endowment fund management). The general trend of development will be their price rise since superprofessionals (experts) in various subject areas will be involved in the training process [1, 10, 13].

On the other hand, the pandemic has also demonstrated the possibility of mass education, including higher education, through online programs, online courses, and shortening the duration of learning. In Europe, the concept of "spontaneous learning" is widespread, that is, what we call "non-formal education". This is self-education, which can end with certification for attestation or credit transfer. Mass education is characterized by learning regardless of place and time 24/7, all days of the year, which helps to reduce the cost of such programs if you have designed content or use open educational resources. It should be mentioned that the quality of learning on online programs does not decrease.

Let's look further at the factors that should take into consideration for developing a qualitative open educational environment when implementing online programs.

2.1. Student-Centered Principle

Online learning is based on the student-centered principle, which reminds us that students are the main subjects of educational activity and their interests, and the expected result of the activity is fundamental (Fig. 1).

Figure 1: Model of student-centered education of the Institute of the Online Education

The student-centered educational process can be organized in the Learning management system (LMS) such as Moodle, which is the most used platform in Russia and the world. LMS Moodle fully meets the requirements of federal state educational standards in terms of creating an electronic educational environment for a university and, accordingly, provides management of all the essential processes of educational activities.

There are three main roles of the educators in the implementation of programs based on LMS Moodle. The first role is the development of online courses in all subjects in each semester. The second role is to accompany the learning process using online courses. The third role is a regular update of online courses (e.g. two weeks before the start of the next semester).

Based on LMS Moodle it is possible to create a virtual educational office, which replaces the dean's office. It contains various information for students and educators, gives a possibility to communicate, use corporate and personal accounts, etc.

2.2. Open Educational Resources

Building an effective open educational environment requires not only creating own educational resources but also sharing them with other universities and borrow high-quality open educational content. For this purpose, were created the Open Online Academy of the Financial University (OOA), the Open Auditorium of the Online Academy and was opened, and access to online courses from the world's leading universities on the Coursera platform.

One of the aims of creating the "Open Auditorium" project of the Online Academy was to include elements of elite education in our open educational environment. The best academicians, university professors are invited to open classes, where students can have a chance to ask questions, receive feedback, etc.

Every year, the number of Russian and foreign learners in the Open Online Academy of the Financial University keeps growing. Three models can be used to integrate our online courses into any university's educational process: 1) complete replacement of a course with an online course; 2) replacement a part of the course with an online course (blended learning); 3) an online course becomes an on-campus course or elective. In addition, online courses allow you to personalized learning, develop practical skills, increase students' learning motivation, mainly through advanced possibilities. For example, most of our online courses have built-in dialogue simulators [3, 9].

2.3. Educational Online Events

In our opinion, one of the most important elements of an open educational environment is the organization of educational online events for students. Educational online events can allow the online student to fully experience university life. For instance, students can participate in the international online conferences, competitions held in the official accounts of social media of the Institute or university, online "Doors Open Day", the "Student Atlas" project, etc. [4].

In the case of the Financial University, there was held an inter-university online game between six teams from four Russian universities. The even were based on the simulation "Corporate Governance" and held within the International Scientific and Practical Student Conference "Digital Impact: Society, Economy, Innovation".

The simulation "Corporate Governance" is aimed to develop decision-making skills by managing a large manufacturing company. The simulation is based on an enterprise model that includes production, marketing, personnel management, financial management, logistics, etc. For two days of the event, all participants came up with a strategy for the development of a virtual company, showed remote teamwork skills, and basic management competencies.

Those events help motivate students to study together, which is a current issue in the education system, especially in online learning. Our experience showed the importance of online events because, unfortunately, some students of online education programs do not feel like university students, feel distant and isolated, and do not feel a part of the university.

Figure 2: The simulation "Corporate Governance"

2.4. Simulations in the Educational Process

Another essential element of an open educational environment is the use of simulations in the educational process. The Financial University has accumulated sufficient experience in the creation and application of computer simulations.

Simulation-based learning is an alternative format for providing theoretical knowledge with the possibility of applying it in practice and developing skills that are not always available or effective in the context of traditional learning and even at work itself. Analysis of the literature shows that leading foreign and Russian universities have been actively using business simulations in economic disciplines for a long time. Applying simulations in education has been proven not only to provide knowledge in a particular area, but also to form students' hard and soft skills, such as analytical and critical thinking, managerial decision-making, teamwork, and problem-solving skills.

The application showed that despite business simulations' possibilities in online learning, educators prefer to use them in face-to-face classes to organize discussions. However, in the spring of 2020 due to the mass move to online learning, many universities started to use simulation in online classes [6].

For example, at the Financial University during the pandemic, some faculties used such simulations as: "Corporate Governance", "Endowment Fund Management", and "Introduction to Blockchain". The Financial University's simulation "Introduction to Blockchain" is currently one of the few business simulations which are integrated into an online course. The trend of business simulation integration to the online course and LMS platform started after the growth of interest in online and blended learning, especially since the 2020 pandemic (Fig. 3).

In 2021, the Financial University also developed a simulation of future career trials that include various enterprises with different management methods. In this simulation, students try to "seek employment" and then "work" in various companies (banks, IT companies, insurance companies, etc.), in different positions (e.g. financial officer, economist, accountant, manager, etc.). This simulation can also be used within the Russian model "2 + 2 + 2", which assumes that student from the second year of study can change their major or field.
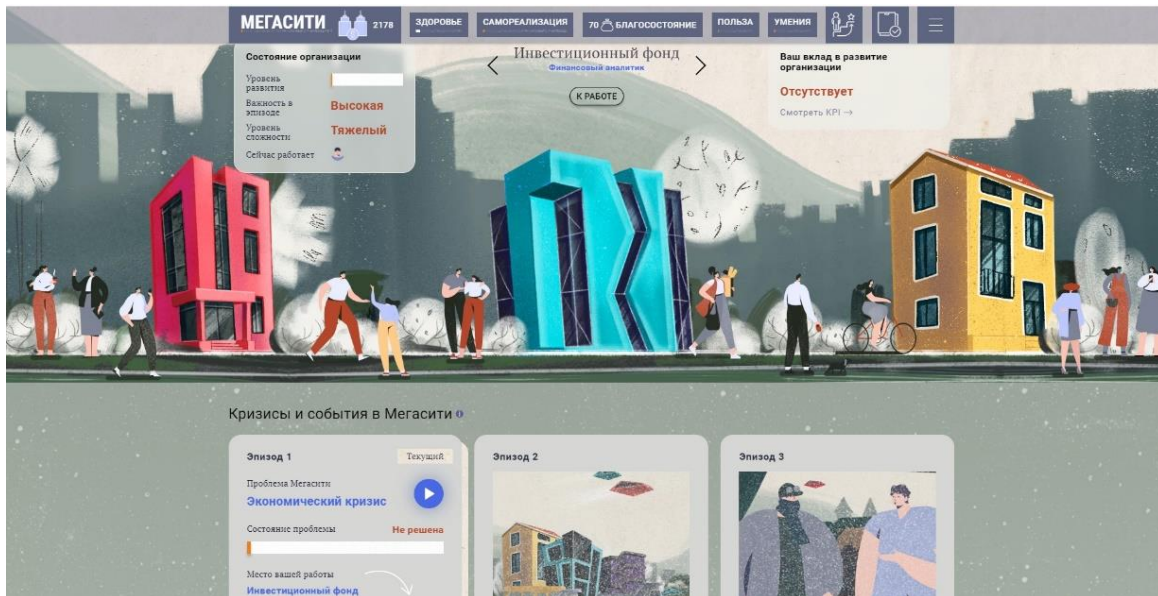
Figure 3: Computer simulator "Future career trial platform"

2.5. Conducting Scientific Research: Training Data Analyst

The application of modern technologies in the educational process requires a scientific justification and, in our opinion, the basis for the organization of an open educational environment is the results of scientific research, confirming the effectiveness of modern pedagogical and digital technologies. For this purpose, the Laboratory of Online Learning and Data Analysis in Education was established, which collects and analyzes educational data from LMS Moodle, studies neurotechnologies in education, development of methodological recommendations for the integration of simulators, and simulators into the educational process, etc.

Let us present the results of some studies that were carried out in the 2020-2021 years.

The development of online learning is accompanied by an increased focus on quality, which is managed on a basis that goes beyond learner control but also learning processes, their organization, and means used. The task of quality management is complicated by technological developments and the need to integrate various pedagogical and digital tools into a unique e-learning environment. The advent of PLE and MOOCs makes it difficult to ensure the quality of online learning without familiar management tools and requires new solutions, allowing, on the one hand, individualizing learning, and on the other hand, managing learning quality monitoring [8]. Therefore, to assess the effectiveness of the educational process of the Institute for Online Education, a model has been developed to analyzes the activities of teachers and students at the level of a separate e-learning course, and the system as a whole.

Data for analysis are extracted with multiple tools (plugins), integrated into LMS Moodle.

1. *Construction rating of the teacher activity*

Rating of the teacher activity for LMS Moodle, which is based on data and take into a number:
- courses for teachers in the system;
- students in the system;
- active students in the course;
- activities of teachers to create content and accompany students;
- activities of students to view content and execute tasks (Fig. 4-5).
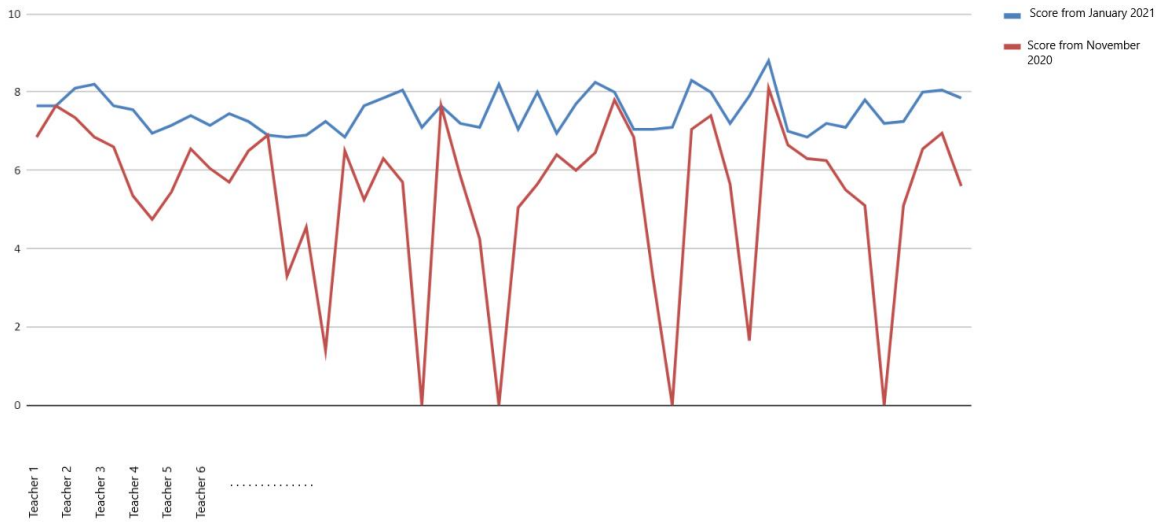
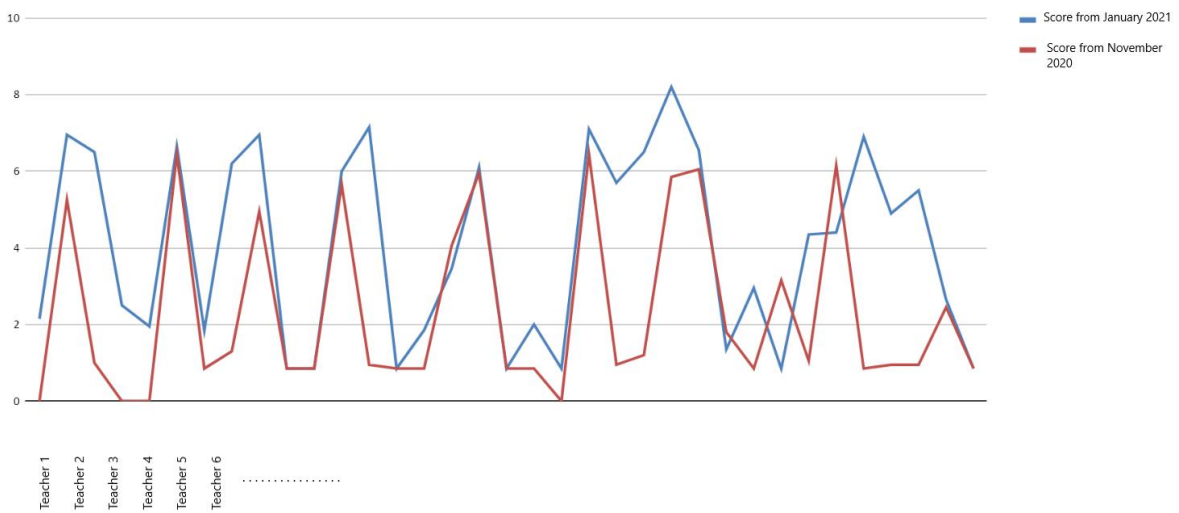**Figure 4**: Activities of teachers (bachelor's degree programmer)

Figure 5: Activities of teachers (master's degree programmer)

During the school year, data were uploaded twice during the first semester. As the analysis of the data showed, the activity of teachers in bachelor's programmers increased during the semester. Some activities contributed to this development: advanced training courses, a series of digital workshops, individual consulting, updating of the database of local normative documents, etc.

2. *Calculation of the index of e-learning course productivity*

The index of e-learning course productivity was calculated based on user activity data received, which demonstrates how successful a teacher is in optimizing the process of accompanying students in an e-learning environment and reducing labor costs. The index of e-learning course productivity shows the effectiveness of the teacher's use of digital and distance education technologies (Fig. 6-7).

The data showed that by the end of the semester there had been an increase in the activity of both teachers and students, which testified to the quality of the educational process in the digital environment.
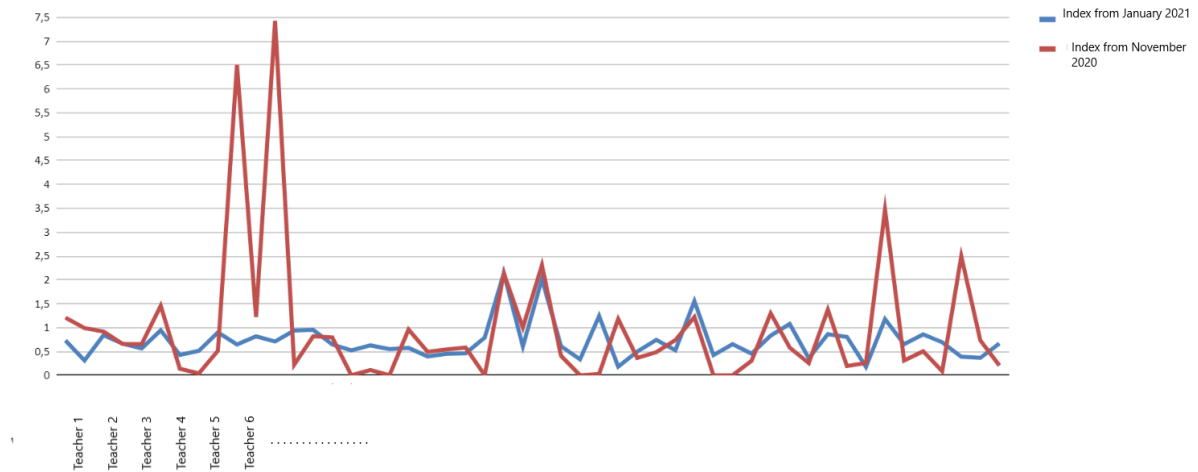
Figure 6: The index of e-learning course productivity (bachelor's degree programmer)
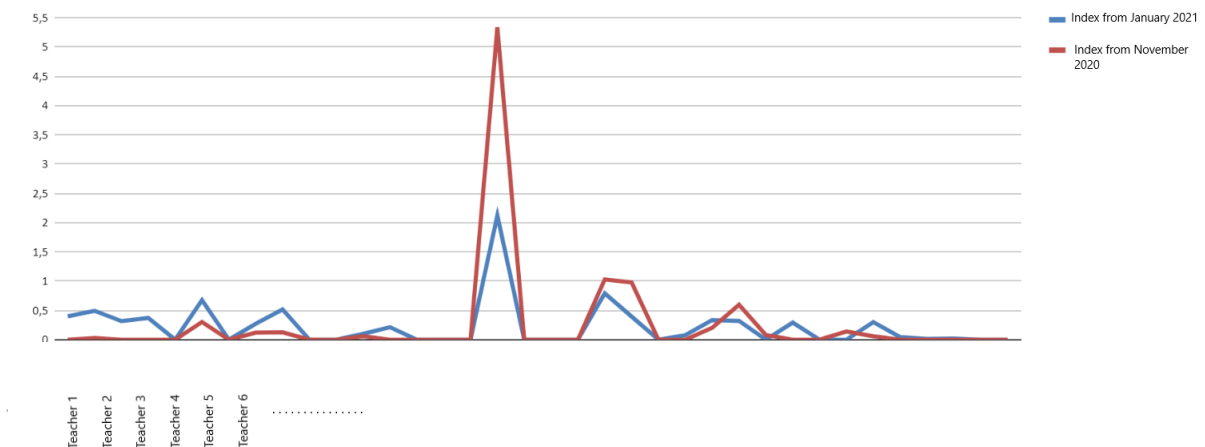

Figure 7: The index of e-learning course productivity (master's degree programmer)

3) Evaluation of the quality of e-learning courses in LMS Moodle by students

From 12 January to 8 February 2021, students were asked to assess the quality of e-learning courses by completing a questionnaire that was automatically built into the content of each e-learning course. The questionnaire was involved to identify e-learning courses characteristics with low scores. Анкета содержала вопросы с единой шкалой оценивания, сгруппированные в шесть категорий:

- training materials,
- organization of the training process,
- individualization of learning,
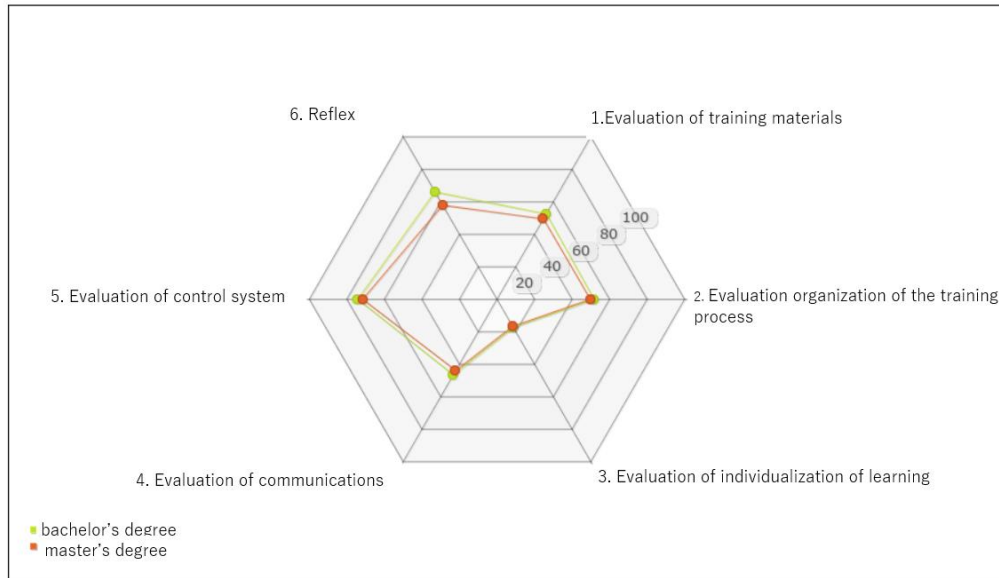- communication,
- control system,
- reflex (Fig. 8).

Figure 8: Summary results for bachelor's and master's degrees

An analysis of the results for each category showed that there were individual parameters that received very low scores as well as those with high scores (Fig. 9).
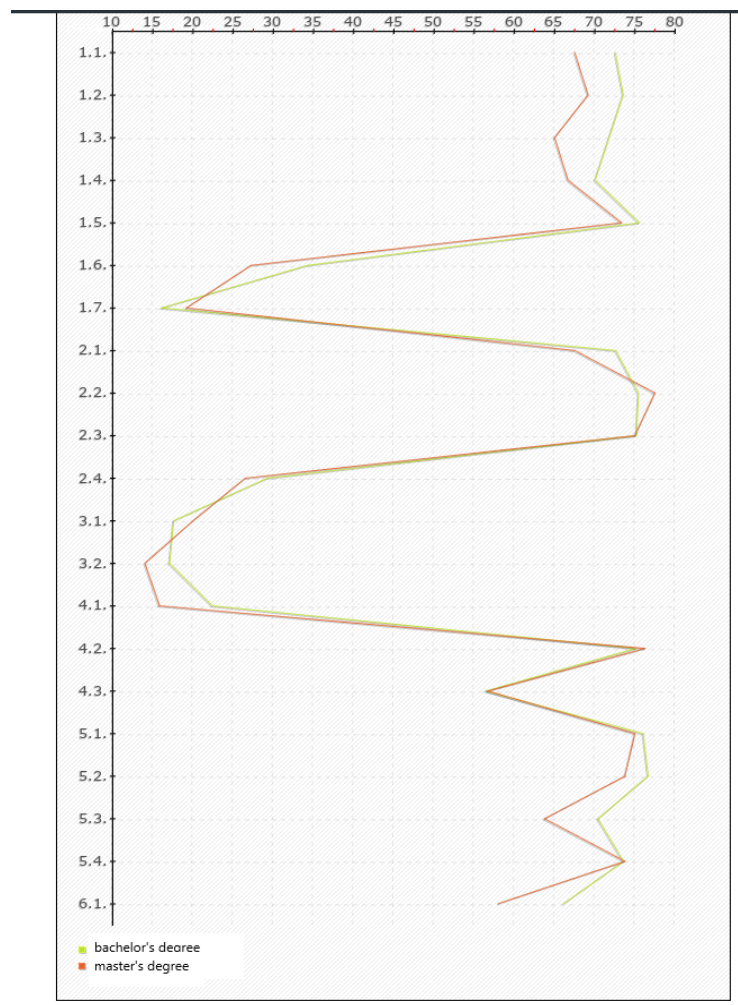

Figure 9: Detailed data by category

As can be seen from the diagram (fig. 9), the lowest score (below 50) was obtained for the following parameters:

- Category "Training materials":

Cause: the formats of the course materials are non-disclosure. In e-learning courses, teachers do not make sufficient use of interactive training materials.

- Category "Organization of the training process":

Cause: students are offered limited jobs that they need to perform in e-learning courses.

- Category "Individualization of learning":

Cause: e-learning courses have no tasks in which the teacher offers different ways of doing it. During the development of e-learning courses, students cannot «try on» different «roles».

- Category "Communication":

Cause: teachers don't use enough motivational techniques in e-learning courses for successful and timely completion.

The analysis of the results allows for the identification of further actions to improve e-learning courses for their subsequent launch in the next academic year, the planning of work with teachers, aimed at their professional development in the field of digital and online technologies, to organize work with students on their educational motivation online environment.

Thus, the analysis of monitoring data allows assessing the effectiveness of the implementation of online learning as a whole, the work of individual entities (teachers, students, tutors), structural subdivisions (Departments, Faculties), and make management decisions to optimize online learning processes at our University.

The monitoring system allows finding best practices of online learning at the university, to attract successful teachers to form a mentoring system on the application of LMS Moodle tools in the educational process.

Results allow developing incentive mechanisms for teachers' work with e-learning courses in LMS Moodle, thus creating a transparent system for the evaluation of teachers' performance in a digital university environment with objective and measurable indicators.

The LMS Moodle Learning Monitoring System allows not only to control the real work of students and teachers but also to influence the results of learning, the improvement of its teaching methods, and quality in general.

2.6. Working with Teachers

The creation of an open environment requires close collaboration with teachers. For this purpose, the project "Digital Teacher's Workshop" was organized (Digital teacher's workshop), which includes online workshops, to organize online learning through various training activities, using different digital services, technologies, the principles of organizing group work, individual project activities in the online environment, etc. are considered.

The project started in November 2019 and aims to support teachers in developing their digital education environment. The project includes webinars, each of which affects distance learning and the use of different digital tools and services in learning. The project website created "Digital Tool Box", which presents recommendations on the use of digital tools and services for organizing group activities, and independent work of students. The Box is constantly updated with new instructions.

The project is an international project, with more than 2 000 participants from more than 100 higher education institutions, colleges, and schools from six countries: Russia, Kazakhstan, Belarus, Kyrgyzstan, Azerbaijan, and Moldova.

The project "Digital Teacher's Workshop" is very popular among teachers. During the pandemic, it proved to be a good tool in the transition to distance learning and helped project participants to learn many new digital tools that enabled them to achieve pedagogical goals. Since participating in the project's webinars, many teachers have become active in the use of digital technologies in their pedagogical activities, and those who have applied them in the past are constantly learning a lot and are discovering interesting digital educational technologies.

Especially teachers note that the "Digital Teacher's Workshop" project has proved to be a valuable motivational tool during the university's transition to distance, and information, derived from this

project, providing support for the transition to distance learning. The project helped not to lose optimism and to gain confidence in the future among university teachers. [2]

Thus, as the experience of the Institute of Online Education has shown, an open educational online environment requires a special approach to its construction and implementation.

Important factors to consider, which improve the quality of online education:
- student-centered principle;
- development of quality educational content;
- application of open educational resources;
- use of modern digital technologies;
- conduct of extracurricular educational activities;
- working with teachers to develop digital technologies;
- researching an online environment.

A structured system based on identified factors will create a quality open educational environment for any university.

3. Acknowledgments

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