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Research Paper

Electronic learning resources and online education technology: issues of effectiveness evaluation

Maxim R. Moskalenko [1] , Evgenij M. Dorozhkin [1], Olga A. Tolstykh [1], Uliana E. Marakulina [1], Maria V. Mustakimova [1] *

Russian State Vocational Pedagogical University, Yekaterinburg, Russia
**Corresponding author E-mail: e-mail: max.rus.76@mail.ru*

Abstract

The relevance of the problem under investigation is due to the widespread use of electronic learning resources and online education technologies in Russian universities and the need to improve their quality for increasing the students learning efficiency. The article aims to study the possibilities for improving the efficiency of e-learning resources and online education technologies and their application specific in teaching students. The leading method of this issue research is the analysis of electronic learning resources and online education technologies use at Russian HEIs. Research results: analysis of electronic learning resources and online education technologies use at Russian HEIs was conducted; approaches for evaluating the efficiency of electronic resources and online education technologies use were developed; recommendations on improving the e-learning resources and online education technologies use were formulated, as well as for developing methodological and pedagogical support for their use in the educational process. The article materials can be useful for: higher-education teaching personnel who one way or another uses e-learning resources and online education technologies in teaching activities; HEIs' leaders; materials developers and employees of universities that are involved in the practical introduction of e-learning resources and online education technologies into the educational process; students and post-graduate students.

Keywords: *Learning Efficiency; E-Learning Resource; Online Education Technologies.*

1. Introduction

The use of e-learning resources and online education technologies became very actively implemented in the educational process of the most Russian universities in the 1990s. Like any innovation, they have undergone several stages in their assessment:

1) Adoption and attempts of universal application (including those cases where the understanding of the teaching material required personal contact of the student with a teacher);
2) Period of critical attitude when problems in the application of e-learning and online education technologies have been identified: weak readiness of students for this type of education (since the online learning requires a high degree of autonomy and self-discipline, responsible attitude to learning and motivation of student), hence the relatively low effectiveness of mastering the learning material (often close to the independent mastering the subject with the help of various textbooks and teach yourself books); weak integration of students into the life of the University, problems of their socialization, etc.;
3) More balanced and deliberate inclusion of online technologies in the educational process, the prevalence of mixed forms of learning (online methods are combined with personal communication with the teacher in the context of the subject study, consultations, etc.).

All this has made it relevant to assess the effectiveness of e-learning resources developed for students and online education technologies use.

The issues of evaluating the effectiveness of e-learning resources and online education technologies are considered in the works of the following authors: [1-10]

In these studies the following issues have been developed insufficiently:

- issues on application of online technologies in teaching students with various types of perception and assimilation of information;
- features of educational-pedagogical work with students in conditions of planning wide use of online education technologies;
- issues on the estimating use effectiveness of online education technologies and e-learning resources.

The scientific novelty, theoretical and practical significance of this work is to study these issues.

In foreign education systems, the methods developed in detail for assessing the quality and effectiveness of e-learning resources and online education courses are applied, for example the University of California offers the following evaluation system: e-learning courses levels are divided into: basic, effective, model, and evaluated by categories: students support and resources; organization and design of the e-course; pedagogical design and delivery; evaluating the effectiveness of students education; innovative technologies in education and teaching; use of feedback received from students [11], [12]. In addition, in a number of states, such as Canada, the regulation of online education is carried out with the participation of non-governmental structures [13]. In order to improve the effectiveness of educational and pedagogical work with students and their successful socialization (in context of widespread use of online technologies and education on individual

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educational paths), great emphasis is placed on the active work of tutors.

2. Methodological framework

2.1. Methods of study

The study is based on the following principles and methods:

1) Analysis and synthesis of methods and application forms of e-learning resources and online technologies for student education;
2) Pedagogical analysis of the problematic aspects and difficulties encountered in the use of online education technologies and e-learning resources for students of different forms of learning;
3) Identification and synthesis of the experience of evaluating the effectiveness of online education technologies and electronic learning resources in Russian universities;
4) System cities allowing identifying the advantages and disadvantages of e-learning resources and online education technologies application and making proposals to increase the effectiveness of their application in Russian HEIs.

2.2. The experimental base of the study

The experimental base of the study includes: study of issues on the efficiency of the e-learning resources and online education technologies use in Russian State Vocational Pedagogical University and other Russian universities; pedagogical observation and analysis of e-learning resources and online education technologies application in the authors' teaching work. The study examines the different authors ' approaches to assessing the effectiveness of the online education technologies and e-learning resources application in Russian universities, their experience is analyzed and generalized.

2.3. Phases of the study

The study was conducted in three stages:

1) Study of application features of the electronic learning resources and online education technologies in Russian universities.
2) Analysis and generalization of the experience of various authors views on evaluating the effectiveness of online education technologies and electronic learning resources use in Russian universities;
3) Consideration of the areas of concern that arise from the online education technologies and e-learning resources use in Russian universities, and the introduction of proposals to improve their use.

3. Results

Higher education in Russia is in the process of reforming, which is intended to resolve a number of accumulated contradictions and bring it to a new level of development in which the best achievements of the Soviet high school and Western experience would be organically combined . Therefore, there is a need to reform the learning process, to increase the use of e-learning resources and online education technologies, as well as activation of independent work of students. The purpose of students' individual work is to study discipline systematically, reinforce and deepen the knowledge and skills obtained.

The law "On education in Russian Federation" from 29.12.2012 No. 273-FZ, article 16 regulates the implementation of educational programs using e-learning and online education technologies.

According to this law, e-learning is understood to be the organization of educational activities, applying the information contained in databases and used when these educational programs implementing and providing the processing of its information technologies, technical means, and information and telecommunications networks for transmitting this information by means of communication line, as well as the interaction of trainees and educators. Online education technologies are understood to be education technologies implemented mainly using information-telecommunication networks in indirect (at a distance) interaction of students and teachers.

E-learning and online education technologies have certain advantages:

1) The opportunity to study at their own pace and flexible schedule (Sivokon, 2016). A student can independently calculate the time and duration of his or her classes, which is particularly relevant for working students;
2) Territorial accessibility of education, regardless of the geographical distance of the student from the HEI (Krechetnikovand Chernenko, 2001).
3) Online training develops the student's ability to self-training, and may, with an appropriate approach, promote the gradual introduction of individual education paths in Russian HEIs.
4) The skills of professionals to work with different electronic network resources are increasingly required by the employer in a wide variety of industries, and the extensive use of e-learning environment develop these skills in students. Learning these skills, as well as the ability to use e-learning resources and online education technologies for future pedagogical work for students in vocational-pedagogical fields, is much relevant [14].

But there are also obvious drawbacks:

1) Lack of real communication between students and teachers;
2) Difficulty in educating students and pedagogical influence on them;
3) For implementing online courses, it is required that the student have self-discipline, autonomy and a high level of organization, but not all students have these abilities;
4) Difficulty in conducting practical exercises because the educator is restricted in choice of their forms, for example, it is difficult to apply role-playing and business games, etc.;
5) Problems of student's socialization and their integration in the life of the University and extracurricular activities.

One can agree with the opinion of a number of researchers (Palat, Moiseev and Petrov, 2006; Alferov and Lebedev, 2009) that in order to increase the training effectiveness the development of the online course should be based on the following provisions:

1) The core of learning process is the individual learning activities of the trainee (learning, not teaching).
2) For students there is the opportunity to get knowledge there and then, where and when it suits them. On the other hand, the students should get not only a certain amount of knowledge, but also learn to get knowledge and work with information on their own.
3) Independent acquisition of knowledge involves active cognitive activity of the student and practical application of acquired knowledge.
4) The organization of the independent (individual or group) online activities of the students involve the use of the latest pedagogical techniques: the method of projects, learning in cooperation, research and problem methods, multi-level learning, modular learning.
5) There is a need for multi-level learning technologies depending on the students willingness, material assimilation and individual requests (e.g. levels A, B, C).
6) Maximum possible interactive communication of the student with the teacher, feedback between the trainee and learning material.
7) E-learning course structuring should be modular so that the student had the opportunity to understand clearly his progress from module to module.
8) The control of learning should be systematic. With this, it can be built on the basis of prompt feedback (for example,

the possibility of appealing to a teacher or a course guidance counselor) and on delayed control (e.g. when testing).

There are different approaches to assessing the effectiveness
Of-learning resources and online education technologies.

First, it should be noted that the effectiveness of learning depends on many factors: the quality of taught course, preparation and motivation of students, qualification of teachers, software quality, etc. The traditional method of assessing the effectiveness of online courses - feedback of their participants and customers, usually through questionnaires is often used during extra learning of employees in commercial or government institutions and not much applicable at HEIs.

In [15] offers the following criteria of e-learning resources effectiveness:

- Functionality. Feature that provides interaction with the student, activity tracking in blogs, forums, tests, etc.;

- The system stability;
- System of knowledge evaluation (knowledge assessment and tests, results provision to a user);
- Easy-to-use, user-friendly interface.
- Availability and ease of registration.
- Additivity, ability to make personal settings in the course.
- A variety of multimedia content.
- Learning methods. Most systems offer self-paced learning through reading text material and other media content. The more varied the learning material delivery and services of interaction with the system, the more effective the learning becomes.
- Uniqueness of material.
- Design solution.
- Content-related expertize - allows you to assess the completeness of the subject content, the relevance and originality of the materials used for creating the electronic educational resource. The content of the basic material is determined by the Federal State Educational Standard and the curriculum of the discipline. The basic material can be presented in HTML and multimedia form.
- Psychological and pedagogical expertize - defines the type of the electronic educational resource, assesses the conformity of the content, script and form of the resource provision with the didactic, methodical and psychological requirements, as well as the purposes of resource creating and the effectiveness of educational technologies application. The educational content should be presented taking into account the specifics of the educational stage and student course, and should be pedagogically appropriate. The level of interactivity of various components of e-learning resource should be determined by the student's age;
- Editorial expertise - assesses the conformity of the e-learning resource with editing, proofreading and layout standards;
- Software and technical expertise - allows you to assess the conformity of the selected technology and tools as well as the quality of the technical implementation of e-learning resource with the accepted standards and the current technical level of the similar products; verifies the health of the e-learning resource as a software product;
- Design and ergonomic expertise -evaluates the psychological-physiological, ergonomic and artistic features of the e-learning resource.

The above criteria should be taken into account in creation of electronic leaning resources and the development of methodical and pedagogical support for implementing the online education technologies.

- The need of assessing the whole learning activity in electronic environment, including self-evaluation of work and mutual peer review by the students;
- The equal distribution of evaluation activities between learning weeks, with establishment of clear deadlines for tasks provision; this has an impact on the student's regular work and development of time management skills;
- The variety of tasks to work with teaching materials and the interaction of students with the teacher and with each other;
- The mandatory availability of instructions, requirements, criteria of assessment and mutual peer review;
- Provision of interrelated transitions between classroom and electronic components, for which the tasks are recommended to be divided into phases implementing consistently in the classroom and electronic environment.

With this, in-class work is aimed at actualization and deepening knowledge, involves a system of tasks on applying and analysing the information received. To ensure transition at the beginning of the lesson, you should summarize the pre classwork: comment on the students' work in electronic environment, answer questions, and highlight the complex moments in mini-lecture format. Post-class work is devoted to supplementing and completing the study of the topic as well as reinforcing the material studied. It includes: homework, final control, updating of tasks performed in the classroom.

When developing the methodical-pedagogical support of the online technologies use, it is necessary to design the learning results (what knowledge and skills the students should have upon completion of the course) and the development of the assessment system of their achievements.

You can agree with researchers that in order to increase efficiency the mixed model is required, the model built on the integration and mutual complementation of traditional and e-learning technologies reducing class hours transferring certain types of learning activities to the electronic environment. With this, work in the electronic environment can take between 30 and 80% of the time allotted for discipline mastering.

The authors believe that students' working hours in the electronic environment may be differentiated according to the form of learning: relatively small - in full-time students, a little more - in part-time students and the longest - in extra-mural students

4. Discussions

The following discussion, problems and theoretical aspects can be identified in assessing the effective use of e-learning and online education technologies:

1) Not all students can effectively master learning material in the dominance of "noncontact" communication because of their personal perception of the information. First of all, we are talking about the students whose future occupation, if it is to qualify for "the object of work" (to which or to whom the activities of the executor is directed), belongs to the group "man-man". In students focused on this group of occupations, the specifics of perception and learning, as a rule, such that the most effective learning takes place through personal contact with the teacher.

In a number of areas of training, for example, in pedagogy, organization of work with youth, etc., the artistic abilities of the future specialist, his ability to work with the audience, and the managerial skills are quite important. In the meantime, with the dominance of e-learning, these student's abilities may be left unused and unnoticed, whereas in the classical face-to-face form of education they can be disclosed in the practice sessions, interactive lectures, extracurricular activities.

In addition, you need to take into account the effect of temperament of the student: it is obvious that, for example, for choleric-extrovert will be much harder to work in the remote format than phlegmatic- introvert. It is clear that the "pure" temperaments does not exist, however, for students with extroverted personality type, focused on the profession group "man-man" will be more difficult to study in e-learning environment may decrease their motivation to learn and academic performance.

It is obvious that there should be an individual approach to each student, taking into account the particulars of his perception and

motivation. But the methodical-pedagogical support of such approaches in the implementation of online education technologies is still in the process of formation, and in the meantime teachers are acting on the basis of their experience and the characteristics of the discipline being studied.

2) In online education technologies, the scheme of information transmission becomes more complicated: from the scheme "teacher-student" we go to "teacher-text-student", and after answering the student's questions we go to "student-text-teacher" (if the activity is takes place in the form of correspondence). In addition, the very possibility of multiple viewing of video lecture posted in the educational environment does not imply note-taking as during full-time class. The absence of necessity for note-taking makes it worse to memorize the material and does not develop the student's skills in its analysis, separating the primary from the secondary.
3) The methods and forms of working with students using e-learning and online education technologies imply a sufficiently high degree of education individualization and are intended for students with a high motivation for learning and self-discipline. However, as the teaching experience of the authors of this work shows, not all students have these qualities developed to the desired extent. The traditions in the organization of higher education in our country having been developed during XX cebtury did not provide the individualization of education. It should be noted that the unwillingness of the vast of Russian students to study in regime of European universities (where the individual trajectories and online learning technologies are widely used) because of the fundamentally different organization of the learning process.
4) It is being noted the difficulty in educational and pedagogical work with students who spend a significant part of their learning in online format. In the Western HEIs this work is carried out by tutors, the effective methods of assisting students in educational activities, and social matters are established and implemented in practice, and the communication of students with a tutor is often confidential and more personal. In Russian HEIs, the role of tutor is not clearly defined at this time, and the institution of tutoring is still being formed.

In most Russian universities of 1990-2000s, the educational objectives were imposed on curators of academic groups. The curators were the educators of graduate chair (sometimes without regard to their aptitude for educational work), and the curatorship was a supplement to the high teaching workload of the educator. This often resulted in the formalization of the curator's relationship with the students.

During Soviet times, a significant part of the pedagogical and educational work was done by the Komsomol organization of universities, providing great help to the faculty and administration. In the 1990-2000, after the Komsomol organization has disappeared, educational and pedagogical work with students was actually carried out by the following persons: the group's curator, head of the graduate chair, Dean's staff and material developers, subject educators. In this scheme, the educational and pedagogical work with students goes into the background first of all because of staff responsible for it is very busy due to teaching and guiding work. Communication with students was fragmented and educational measures began to be taken generally if there have been any emergencies (serious conflict of a student with a group or a teacher, long non-attendance without good reason, etc.).

In addition, the profession prestige of the teacher and university educator has fallen sharply in society and the young people's worldview changed as well. The criminalization of the youth environment increased, among the behavioural and life orientation of the high school students the trends in consumer attitude towards society has become significant as well as the formation of ambitious positions claiming against the society for their failures, and spreading of youth infantilism increased.

All of this has resulted in a dramatic decrease in the quality of educational and pedagogical work with students and drop in the level of family culture among students.

At the moment, this problem is a concern of the pedagogical community and the possible solutions are being put forward, for example, the concepts of effective works of the teacher-tutor are being developed based on the foreign experience. The authors of the article believe that there is a need for educational and pedagogical work to consider along with learning and methodical one as a priority, and to give it greater attention in the development of methodical-pedagogical support of educational process.

5. Conclusion

In order to improve the application effectiveness of e-learning resources and online education technologies in the learning process, it is necessary to:

1) When developing the methodical-pedagogical support of online learning technologies in formation of knowledge and skills that a student should have on completion of the course, you must take into account the requirements of employers to make education maximum practice oriented.
2) Plan the students working time in electronic environment on a case-by-case basis, depending on the form of training: relatively small - in full-time students, a little more - in part-time students and the longest - in extra-mural students.
3) Pay great attention to the efficiency of teaching and educational work with students, and students-centered approach, take into account their different abilities to assimilate the material in a distance format.
4) When developing e-learning resources there is a need for multi-level learning technologies application depending on the students readiness, materials assimilation by them and individual requests (e.g. levels A, B, C).

The article materials can be useful for: higher-education teaching personnel who one way or another uses e-learning resources and online education technologies in teaching activities; HEIs' leaders; materials developers and employees of universities that are involved in the practical introduction of e-learning resources and online education technologies into the educational process; students and post-graduate students.

The study has raised new issues and challenges that need to be addressed. The concept of improving educational and pedagogical work with students should be developed in the context of the widespread introduction of online learning technologies; this concept should take into account the best traditions of Russian universities, as well as the experience of tutors of European Universities. The system of teacher's work evaluation on creation of e-learning resources should be improved because they are very large and in case of their underestimation, it is possible to overload the teacher that resulting in the emotional burnout and the work quality deterioration. The effectiveness of e-learning resources and online education technologies should be assessed according to certain, carefully thought-out indicators.

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