Experience of e-learning implementation through massive open online courses

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Abstract. E-learning is considered to be one of the most prospective directions in education development worldwide. To have a competitive advantage over other institutions offering a wide variety of educational services it is important to introduce information and communication technologies into the educational process to develop e-learning on the whole. The aim of the research is to reveal problems which prevent from full implementation of e-learning at the Reshetnev Siberian State Aerospace University (SibSAU) and to suggest ways on solving those problems through optimization of e-learning introduction process at the university by motivating students and teaching staff to participate in massive open online courses and formation of tailored platforms with the view to arrange similar courses at the premises of the university. The paper considers the introduction and development level of e-learning in Russia and at SibSAU particularly. It substantiates necessity to accelerate e-learning introduction process at an aerospace university as a base for training of highly-qualified specialists in the area of aviation, machine building, physics, info-communication technologies and also in other scientific areas within which university training is carried out. The paper covers SibSAU’s experience in e-learning implementation in the educational process through students and teaching staff participation in massive open online courses and mastering other up-to-date and trendy educational platforms and their usage in the educational process.

Key words. E-learning, distance learning, online learning, massive open online course.

1. Introduction
Term e-learning, which means the educational process by electronic means through the Internet facilities, became widespread during the last 2-3 years. The process of conversion from traditional education process to the computer-based one has been gradually developed during the last decades. Since the large, represented on the machine-readable carriers, archives appearance and the amount of information and knowledge enlargement, frequently appears the idea to use this material for educational purposes, as being the only form that is able to keep pace with intellectual content generation. In the occurred situation the e-learning stands for the new technological environment of knowledge delivery from the open sources. Globally, the e-learning became available due to the Internet development, that provides the opportunity to send the required quantity of data from one part of the world to another, communicate easily with other net users online and post information on Internet websites, making them available for anyone. Finally, the appearance of education through the information technologies is due to the market mechanisms influence. Growing demand for higher education resulted in the educational services market appearance, where universities became competing stakeholders in the educational content distant delivery area.

If we review the steps of e-learning by using computer technology development, then they could be represented in a following way:
- the courses on removable media;
- educational websites;
- electronic online platforms.
2. Implementation of e-learning at SibSAU

Nowadays the application of the distant learning based on Moodle platform actively used and enhanced [1]. This learning is applied for part-time and additional educational program’s students. This educational process is based on motivated and controlled intensive self-dependent work of the learner, who can study in the convenient place due to the individual schedule, carrying special learning tools set and concerted opportunity to contact with the teacher. Talking about advantages of the distant learning, first of all, it has positive sides for students, like: learning schedule’s flexibility, opportunity to study by individual plan according to their own needs and abilities, unprejudiced and independent from the professor’s knowledge assessment system, opportunity to consult with the teacher during the study. Such form of education primarily means the appearance of additional possibility for the teachers to present material to students, i.e. de facto the opportunity to teach more students within the same teaching load appears.

Recently, involvement of the Internet in the education, quantity of online courses, their themes, various ways of realization and the general orientation on the whole ended up with more capacious term – e-learning. European committee defines e-learning as “the usage of modern media and Internet technologies for education quality increase at the expense of resources and services accessibility enhancement, and also distant knowledge exchange and joint work”. Today e-learning is the educational process, where interactive electronic information delivery ways are used: removable media, corporate networks, the global network.

Despite achieving its first-priority goal as distant learning through the Internet, e-learning is also a great addition to the full-time study and can be a good support for traditional study’s quality and effectiveness increase. Obvious advantages of e-learning are: vast freedom of access – the student has an access to the electronic courses through the Internet from any place, where global information network connection exists; competent, qualified education – the courses are created by the whole team of specialists, what makes e-learning mature and qualitative one; opportunity for electronic course content separation into modules, small blocks of information, that allows to make studying process more flexible and simplifies search of the necessary materials; flexibility of studying process – duration and order of learning material are chosen by the student himself, completely adapting the whole studying process to fit his abilities and needs; opportunity to study in the workplace – students can acquire education on-the-job (if there is any), at home and on the way using mobile Internet; opportunity to develop with the times – electronic courses users: both teachers and students develop their skills and knowledge due to the cutting-edge technologies and standards, electronic courses allow to promptly refresh educational materials; opportunity to define criteria for accessing knowledge – during e-learning there is opportunity to specify clear criteria of knowledge assessment, that the student gained during the educational process. Undoubtedly, advantages of e-learning are obvious: flexibility, time saving, ease to review what has already been learned [2].

Such form of education is also wide spread in SibSAU for full-time students’ education, for instance, during foreign language courses.

3. Massive open online courses as e-learning development method

One of the e-learning elements applied at practice are Massive Open Online Course (MOOC). Massive open online course is the distant Internet-learning method that is remarkable for the following characteristics:

- a large number of courses participants as compared to regular university courses;
- despite commercial nature of MOOC business the course has open pattern of its structure, content and educational aims. However, it can have additional commercial components, for example, in terms of paid certificates issue at the end of the course;
- a course is held completely online with the help of both asynchronous and synchronous educational methods.

Wide range of informational and educational technologies is used in the process of MOOC’s development and realization. Basic technologies are integrated video lectures with integrated presentations, graphics, interactive tasks and text information. These elements allow increasing the level of tasks interactivity that can hasten educational process and reveal problem blocks in studying process to focus on in future. Moreover, the course’s participants motivation arise should be noted, they can see and realize the essence and importance of processes studied within the course, and can also view the result right after the task is done, analyze mistakes and pursue their own educational line of the further study inside of the course. The second important MOOC’s technology is accessing each other. This technology enables to access the competence level of other course participants, who are, either way, united by the course theme. Because of this technology the interactive
communication occurs not only between students and teachers, but also between students among themselves through the forums, communities and other integrated software. Provided opportunity increases participants’ competitiveness and brings them to the more proficient level of knowledge. Other technologies, like wiki- projects, researching and team nature of work also play a vital role in MOOC.

Implementing such technologies, more attention is paid to advantages, rather than disadvantages, because they negligible.

One of the advantages is the fact that there is an opportunity to organize MOOC in any environment, where the connection is available, in any language, using different online instruments of the target area. The education process takes place in a more informal form that helps to overcome a psychological barrier (fear to make mistake or speak in a wrong way, fear to be disapproved by other project’s participants or teachers, etc.) and gain knowledge freely. There is no need for participants to provide educational qualifications or other document, confirming their education level or identity. Motivation is the only thing that is needed. With the motivation participants enhance living skills needed for study. The participation in MOOC’s program constrains to think about own education and knowledge acquiring.

Monitoring existing international Internet-platforms, on a base of which MOOC is realized, the following should be noticed: Coursera (www.coursera.org) [3], Futurelearn (www.futurelearn.com) [4], Cambridge English Teacher (www.cambridgeenglishteacher.org) [5], EdX (www.edx.org) [6], Udacity (www.udacity.com) [7], Khan Academy (www.khanacademy.org) [8].

SibSAU’s professors have experience using and working with such a MOOC platforms as Coursera, Futurelearn and Cambridge English Teacher. It’s worth noting that the first two platforms are used by both teachers and full-time students. The Cambridge English Teacher is used only by teachers from the Business Foreign Languages and Technical Foreign Languages Departments.

Coursera is the project in massive online education sphere, founded by Stanford computer science professors Andrew Ng and Daphne Koller. The project collaborates with the universities that publish and run courses in the system on different fields of knowledge. Students take the courses, communicate with fellow students, take tests and exams directly on the Coursera website, and also the mobile application for iPhone and Android is distributed. As at November 2014 10 million users and 844 courses from 108 educational institutions were registered in Coursera.

Futurelearn is the project offering a wide range of online courses, lectured by leading universities and culture institutes around the world. These courses are available not only from personal computers, but also from applications of mobile devices. Thus, course participants have an opportunity to study at any place, in any time if there is Internet access. The founder is British Open University, which has 40-years’ experience in online education development. The project is supported by 40 partners from Great Britain, Europe, Africa, Asia and Middle East. The first course was open in September 2013. In a year approximately 500 000 participants joined the project.

Cambridge English Teacher is the project launched especially for English language teachers of the all educational levels (primary, secondary, higher education) by Cambridge University. The aim of this project is professional competency development in the methods of English language teaching for various purposes area. Like the other MOOC platforms Cambridge English Teacher offers participation in online courses oriented at the increase of both language and professional skills. However, the resource provides the opportunity to take part in online courses, but to attend webinars, forums as well, to get an access to the printed material in e-form that is essential help to the English language teachers in lessons development and conducting taking into account new tendencies in the international society.

The university as being high education institute have to go with the times, tracing all new tendencies in education, applying them for the highly qualified specialists training for organizations and enterprises. MOOC help to promote the university brand in the international education services markets, attracting talented youngsters. Such promotion is one of the steps of accomplishing the mission set by the government to universities, namely, to reinforce the export of Russian educational services. Participating in the projects of MOOC realization, the university gets additional financing through cofounding. This advantage provides the opportunity to the university to receive additional income apart from budgetary funds.

Because of the fact that SibSAU is a regional university, located far away from leading country’s universities, the participation in MOOC projects provides an opportunity of joint network usage of the resources with large universities, and to make up the shortage of professors of not enough developed educational directions. Taking this into account, the opportunity of collaboration appears not only with teachers, but also with specialists and experts in the areas where strong connection with employers, business
structures and outer professional world is needed. The collaboration of this kind will increase the university’s reputation, will provide an opportunity for international cooperation development, and also invited specialists can contribute to university’s projects development and taking them on the international significance level.

Despite MOOC technologies just started to be implemented in Russian universities, the successful tendency of development of this direction in Russia can already be traced. The work is being conducted in the direction of common institutional online departments, virtual scientific laboratories formation in Russian universities; creation of intercollegiate and inter-institutional scientific and educational programs; science and education integration. The global goal that is pursued on the federal level is the creation of Federal electronic researching university.

According to the results of the research, conducted by Education Development Centre of Moscow School of Management Skolkovo, the online education in Russia develops for a long time, but there are already no well-known projects, unlike European countries and USA. As the researchers suggest, this may be connected with the fact that almost all existing Russian online platforms were initially directed at paid rendering educational services and, consequently, are not pretending to cover a large audience [9]. Considering the fact that the government is interested in MOOC technologies realization in Russia, as they can be a network education variant, which is the top-priority aim of development of the education in the country, than the possibility of leading Russian universities motivation for rendering the free access to their resources cannot be excluded [10].

Among Russian universities collaborating with projects in the field of online education, the most active can be defined, which are on the first place for the government in terms of MOOC development and attraction of the more vast masses to them:

- Moscow State University;
- Higher School of Economics;
- Saint Petersburg State University;
- Moscow Institute of Physics and Technology;
- Russian Academy of the National Economy and Civil Service at the RF President.

Some of the above-stated universities already collaborate with the international project such as Coursera, however there is need for Russian projects development. For now, there are MOOC that are organized directly from the Russian universities and organization in fields of education and culture resources:

- Universarium (www.universarium.org) [11]
- Eduson (www.eduson.tv) [12]
- Uniweb (www.uniweb.ru) [13]
- Univer.tv [14]
- Intuit.ru (National Open University INTUIT) [15] and others.

4. Conclusion

To sum up, it should be noted that the process of e-learning implementation in Russian higher education system proceeds slowly, facing particular difficulties: electronic courses quality problem (who and how can access them), legal issues, related to the intellectual property protection, financial ones, concerning the electronic courses preparation costs and their renovation, recruitment problems, related to the training of teachers who are able and want to develop and instantly renew these courses. The low confidence level to the distant form of education in academic circles should also be referred to the factors restraining online education development. The historically developed opinion that the traditional education form is the most effective one still exists in Russian minds. The mass realization process of the all advantages of such education form will take a lot of time. To the other reasons of Russian universities lag in the new education form process can also be referred: the lack of necessary normative base in the distant education sphere; the absence of specialists in electronic courses development sphere; the shortcoming of financial resources needed for electronic educational content development; the absence of teachers readiness to use distant technologies in their work; issues of copyright law and related to it teachers reluctance to publish their recourses in open access.

However, the obvious thing that electronic education is not a temporary passion and we need to care about complex solution of problems mentioned above already today, to prepare teachers and students to use Internet global network and the electronic education facilities as a whole.

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