

Integrating MOOCs in University Curriculum: HSE University Experience

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Abstract. The paper is devoted to the main aspects of using MOOCs as a part of university curriculum. HSE University has the expertise of implementation of blended learning using our own 53 MOOCs on Coursera and 27 MOOCs on Russian National Open Education Platform and courses of other universities. The emphasis will be on institutional decisions, organizational schemes and management solutions that allow to recognize MOOCs' results and transfer them into university credits (ESTC).

Keywords: online education, MOOCs as a part of university curriculum, blended learning, online learning institutional policies

1 Introduction

Universities nowadays are at different stages of implementation of online learning and use different formats to integrate online learning with traditional (such as teaching subjects in web-assisted, blended or online formats). There are a number of important factors that affect the use of online courses in higher education institutions. In our research we concentrate on the following:

- state of online learning in universities, distinguished by type, strategic objectives and the number of students;
- mechanisms and formats of the integration of online learning;
- effects of the universities' management attitude towards online learning implementation in the educational process, these can be the basis for highlighting trends, problems, areas of the lead or lag, justification of management decisions and performance indicators of the university.

Objective: To study the current state of online education in universities in different countries, to identify and describe the major formats of integration of online learning with traditional one, relevant to different types of universities.

On Stage 1 of our research we 1) analyze the current state of online education in Russian universities, depending on the type of institution, university's strategic objectives, the number of students, etc.; 2) identify and describe the major formats of integration of online education with traditional one, relevant to different types of universities.

2 Online Learning in Russia: the dramatically changing landscape

Having started actively penetrating the traditional education system since 2011 [1], MOOCs have extended their influence on education systems around the world. By 2015, at least about 40% of HEIs in Europe were having MOOCs or planning to develop MOOCs soon [2]. Since 2013, leading universities in Russia have also joined the process of approbation of this new educational format, developing their own MOOC courses and studying the possibilities for using MOOCs in their educational process. Russian professional education society also attempted to institutionalize these new educational practices, including implementation of «National Open Education Platform» (NOEP project, openedu.ru), improvement of the existing regulatory framework at the state level, as well as creation a new project "Modern digital learning environment". The latter has been launched by the Ministry of Education in autumn 2016, and aimed on creation and development of public services and integration solutions in the field of online education, regulatory support for the development of online learning, and creation of systems assess of the quality of online courses [3].

2.1 The current state of eLearning in Russian HEI

Taking a closer look at Russian universities we found out that they differ significantly from the point of view of implementation of new technologies in general and attitude towards MOOCs and eLearning in particular. Depending on whether a HEI itself is a creator of MOOCs, and how actively it's using online courses in educational process, Russian universities can be divided into three major groups.

Group 1. Leading universities, they are among the top of national ratings, participate in the Russian Academic Excellence Program 5-100 [4]. It can be both large classical universities, and specialized middle-sized universities (medical, technical). These universities follow the advanced international trends, are open to innovative solutions, actively implement new technologies. On the one hand, openness, internationalization, attraction of the best foreign scientists, teachers and students are stimulated and supported by the State. On the other hand, often the success of the use of online educational technologies is due to the active position of the university senior management. The universities of the first group are not only users of content, which is in our case online courses produced by other universities, but invest in developing inner regulatory framework for MOOCs implementation and approbating different MOOCs integration models. And in addition to that – they are creating their own online courses, placing them on the world's leading platforms, such as Coursera and EdX, and on the Russian National Open Education Platform.

Group 2. Higher education institutions that actively develop online technologies on campus, and are ready to include some MOOCs provided by other HEIs in their curricula, as well as offer several online courses at the national level, in particular for postgraduate education and adult education programs. They become users of online courses from some global platforms and NOEP, conclude Network Contracts (see section 1.2) with Russian universities – MOOCs providers, and use MOOCs in their

educational process. These universities demonstrate willingness to adapt their internal regulatory framework so that it allows the implementation of innovative educational formats, including the use of online courses of other universities as a part of the educational program.

Universities belonging to the Groups 1 and 2 are presented in the Table 1.

Table 1. TOP Russian HEI by number of MOOCs on major international and Russian platforms

HEI	Coursera	EdX	National Open Education Platform	Universarium	Total
HSE University	53	-	27	1	81
Moscow Institute of Physics and Technology (State University)	30	-	19	1	42
National Research Nuclear University MEPhI	19	5	-	3	27
ITMO University	-	1	22	-	23
Saint Petersburg State University	2	-	19	-	21
Lomonosov Moscow State University	-	-	21	-	21
Tomsk State University	18	-	-	-	18
Peter the Great Saint-Petersburg Polytechnic University	1	-	16	-	17
Ural Federal University	-	1	15	-	16
National University of Science and Technology MISiS	-	-	15	-	15
Far Eastern Federal University	-	-	-	14	14
Novosibirsk State University	5	-	-	-	5
Immanuel Kant Baltic Federal University	-	-	-	2	2
Total	125	7	154	21	307

Group 3. Most universities that use web-supported courses in their educational process, but are not yet ready financially and organizationally to invest in innovative approaches to education. Conservatism and skepticism towards online education are manifested here, but low resources are also playing a significant role, the financial situation of these universities is such, that they are unable to invest in new technologies and formats. At the same time, if the management of such universities receives adequate methodological guidance and assistance in legal and organizational support

of the process, we see the first examples of how old concepts and approaches give way to new ones, that take into account modern technologies. Including, some universities of the group 3 have recently realized the need for higher quality education in a number of disciplines and sometimes a shortage of necessary specialized professional teachers as well. These reasons moved some of them to take the first steps establishing cooperation with universities of NOEP project.

2.2 Russian National Open Education Platform (NOEP project)

Following the general trend of other European countries establishing national platforms such as FUN www.fun-mooc.fr in France, MiriadaX <https://miriadax.net> in Spain, FutureLearn www.futurelearn.com in Great Britain, UniversitePlus www.universiteplus.com in Turkey and some others, 8 Russian leading universities cooperated in 2014 to develop a National Open Education Platform openedu.ru. It launched in September 2015 with about 34 MOOCs, and had rapidly grown (see Fig. 1. and Fig. 2.) during the next 18 month to reach the amount of 154 MOOCs with about 1 million enrolments by April 2017.

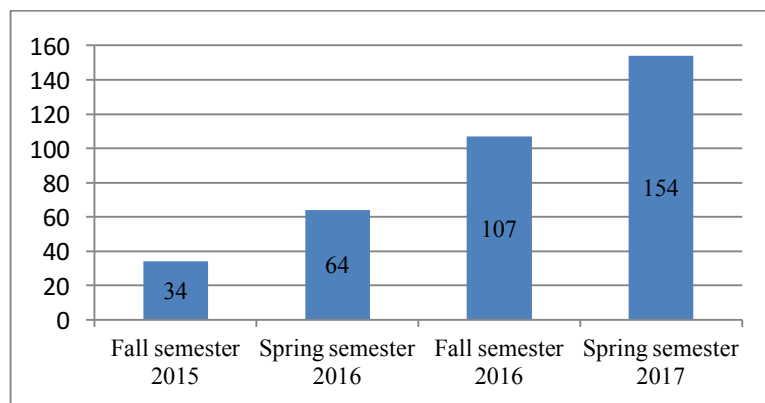


Fig. 1. MOOCs, placed on National Open Education Platform in 2015-17, pcs.

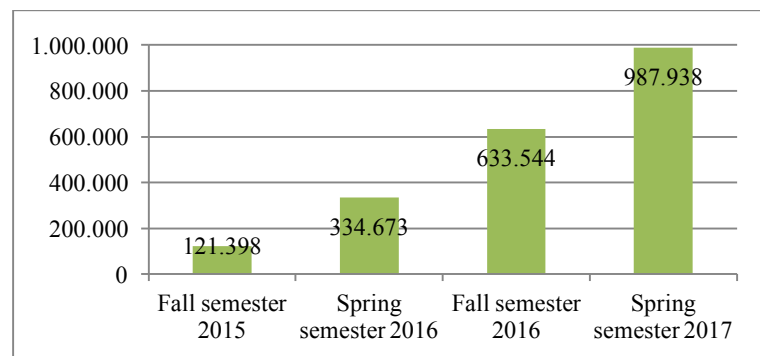


Fig. 2. Total enrollments to the MOOCs, placed on National Open Education Platform in 2015-17, ppl.

From the very beginning the NOEP project was supported by the Russian Ministry of Education, and the Minister of Education has emphasized its mission to involve universities all over Russia into new educational practices, to support the quality of education and the equal minimum standards for all university courses.

Along with general support and promotion of the idea of quality and available online education through MOOCs, NOEP project developed two important initiatives that are positively changing the landscape and the framework of eLearning in Russia. The first initiative has to do with quality standards and requirements that are applied to each MOOC produced for National Open Education Platform: the requirements concern both the presentation format of course core materials (video lectures) and the evaluation system, which involves assessing the competencies declared in the course program. Thus, formalized requirements for courses within the NOEP project allow to guarantee a certain level of quality, helping HEIs to overcome certain prejudices towards MOOCs. In addition, the requirements agreed by eight universities of NOEP assume that a certificate of successful completion of an online course on NOEP can be issued to the participant only on the condition that the exam passes successfully in the proctoring mode, which guarantees protection against cheating and confirms that the certificate was issued to the very person, who mastered this course.

The second initiative affects the formal legal aspects of interaction between higher education institutions, in particular, with the active participation of HSE University lawyers, a “Network Contract” format agreed by eight universities has been developed. Now on the basis of this “Network Contract” all Russian HEIs can include MOOCs from National Open Education Platform in their university curricula, guide students to study, support students during their MOOC-study and eventually receive statements with student grades from a University providing this MOOC on NOEP.

2.3 Institutional cooperation in the framework of NOEP project

The preliminary work done by 8 universities – founders of NOEP project together with conceptual support of the HEI implementation of eLearning by the Russian Ministry of Education made a solid base which actually allows MOOCs to be integrated directly into the educational process of all Russian universities. Since 2015/16 academic year universities in Russia started to approbate the new format of education and inter-university cooperation. During 2015-2016 more than 30 Russian universities have concluded memorandums of intent with National Open Education Platform, thereby assuming the obligation to rework internal regulatory documents in such a way that it becomes possible to recognize MOOCs’ results and transfer them into university credits (ESTC).

HSE University being the leading university both by number of courses (27 out of 154 total) and number of enrolments (293,000 out of 988,000 total) on National Open Education Platform has by now gained some experience of cooperation with universities using Network Contracts. Universities that intend to use MOOCs in their curriculum refer to all three groups highlighted in section 1.1 - these are both the market leaders creating their own MOOCs and “recipient” universities that are more or less actively involved in working with new educational technologies, and this is the first experience of such cooperation almost for all participants.

From 2015 HSE University provided MOOCs for 250 students from 4 Russian universities (4 Network Contracts were signed in 2015, 3 and 2 more in spring and fall semester of 2016 respectively). These students took 6 disciplines, and their academic results were as follows: 68% passed on the first attempt, 32% retakes. When we get a closer look at the students educational patterns and results, it turned out that up to 30% of students are poorly motivated and do not start studying online course materials or dropped out after a few first weeks. These students require significant additional assistance or curriculum office's or program manager supervisor's support to go through the MOOC successfully. As HSE University has 6 more Network Contracts for the spring 2017 semester and 450 students are currently taking our MOOCs on NOEP, we improved the way we support our recipient-universities, making the cooperation more intensive to inform the partners about the intermediate educational results of their students in good time. To study the motivation of MOOC students and to develop of adequate methods of their support will require some additional research and exchange of experience with colleagues from different universities having similar MOOCs' experience.

3 How the HSE University integrates MOOCs into its curriculum: the first results

We started the current research from our home university (National Research University Higher School of Economics (HSE), Moscow), in TOP-10 on Coursera by the number of online courses; HSE includes MOOCs into its curricula since 2013. For this purpose, the University has developed a regulatory framework, in accordance with which its schools can make decisions about credit transfers for MOOCs. These can be of HSE University or other universities' MOOCs available on major open educational platforms, such as Coursera, EdX, Futurelearn, ect. The goals of integrating MOOCs into HSE university curriculum is to improve the quality of our educational programs by including courses which allow to achieve specific tasks with limited resources, for example:

- a course, which is non-core for HSE, delivered by a university leading in the subject;
- specialized course in English;
- a niche course with unique content, delivered by a professor, whom we can't get to our campus;
- optimization of logistics of the educational process due to the transfer of some parts of the course into a blended format. This could be a topical issue for universities with a disperse campus, several buildings of which are located in different parts of the city.

Unlike Juan Antonio Martínez and Joaquim Campuzano from Universitat Autònoma de Barcelona who suggest that the MOOC will not be generated from scratch, but based on a prior SPOC course [5], HSE University moves the other way round. We produce high quality MOOCs for leading platforms, and then let our academic supervisors and academic advisory boards choose the best MOOCs suitable for

their programs. In addition to that, they can determine the format in which this MOOC will be implemented inside our university - whether it will be an independent fully online course, whether it will be used as part of a blended course or whether it will be adapted to the SPOC format for students studying online on HSE intra-University MOODLE platform. At this point producing MOOCs is not cost-effective, but at this point the strategic vision forces financial reasons give way to arguments of quality and development of better educational formats to move forward to keep pace with the world's leading universities.

3.1 Background and regulatory framework

In the academic year 2013/14, the HSE Schools for the first time had the opportunity to include online courses in the educational process due to the fact that HSE created a standard framework (HSE Regulations on Academic Mobility) that regulated the use of MOOC in the educational process. The main tool was the list of recommended courses from Academic heads of educational programs. In the academic year 2014/15, MOOCs were included for the first time in the curricula of 3-5% of students, mainly the faculty of management.

Since 2016/17 academic year, in accordance with the decision of HSE Academic Council, online courses have become a mandatory element for all educational programs. This decision was extended to the head campus in Moscow and to all regional HSE campuses in St. Petersburg, Nizhniy Novgorod and Perm. By the end of 2016, 154 out of 207 full-time bachelor and master programs have included at least one MOOC in students' individual curricula. The decision of the Academic Council provided considerable flexibility in terms of the MOOCs integration format - a course that is studied in online format may be mandatory, elective, additional or adaptive. Moreover, by the decision of the academic head and the academic board of the educational program, MOOCs can be included in blended format, partially or completely replacing the lecture part of the individual offline courses.

Currently HSE University has two mechanisms of enabling MOOCs into student educational plans: 1) At the request of the student, when he/she chooses a MOOC and get credentials for it, in this case the academic supervisor of a program decides whether to consider this course. 2) "White list" - the list of courses with credits for each of them, prepared and opened to access by the academic supervisor of each educational program. In this case, the course certificate is guaranteed to be credited.

For 2016-2017 academic year HSE University included over 350 MOOCs into its curricula, of which 57 MOOCs are HSE University online courses on Coursera and Russian National Open Education Platform. MOOCs are included into the educational plans of 11000 HSE students.

3.2 First results of internal HSE data analysis

Based on existing internal data we are analyzing the following: 1) What types of courses, the schools offer students to study in the format of MOOC (compulsory, adaptive, electives, etc.); 2) Whether the strategy of schools in the selection of the

MOOC type is related to the field of study; 3) Typical difficulties of students, their satisfaction rate.

In order to find answers to these research questions, data from several sources were used:

- the results of monitoring surveys organized by HSE Center for Internal Monitoring;
- analysis of a series of in-depth interviews with different categories of staff and students involved in the process, among them were academic heads of educational programs, program coordinators and curricula managers, deans and vice-deans of schools, students – representatives of the Student council, speaking on behalf of their fellow students;
- following the results of the fall semester of 2016, a strategic session with the heads of educational programs was held, aimed at analyzing the intermediate results, discussing bottlenecks and finding optimal solutions and recommendations that could make the MOOCs' integration process more harmonious and effective for each educational program.

What types of courses, the schools offer students to study in the format of MOOC.

A flexible approach was taken by most educational programs that built MOOCs into its curriculum so as to maximize the educational experience of students, taking into account both the specifics of the professional sphere and the level of students' knowledge. More than 60% of educational programs preferred the format of integration, which allowed to expand the list of existing elective courses. Programs' academic councils consider it especially important for the expansion of professional diversity, while maintaining an acceptable level of expenditure.

Whether the strategy of schools in the selection of the MOOC type is related to the field of study.

A preliminary analysis of the data obtained for the fall semester of 2016 does not yet allow us to reliably answer the question posed. By now we can only outline some general patterns. Humanities are more likely to integrate MOOCs in blended format, which allows a traditional offline exam, revealing competencies that are difficult to verify online. Computer science programs used mainly courses that allow students to study in more depth some specific topics or tools, in this case online programming assessments were fairly reliable verifying students' knowledge and skills. Programs taught in English, as well as programs in the field of international relations, international business and a some others, logically focused their attention on the choice of English-language courses from the leading universities in Europe and America.

Irrespective to the field of study, almost each educational program has faced the challenge of selecting MOOCs out of hundreds of courses presented on international platforms, and the main problem appointed by Academic heads was to assessing the quality of each MOOC. In this regard, within HSE University arise a request to create

a unified system for selecting MOOCs and assessing the quality of external MOOCs selected for integration in university curriculum.

Typical difficulties of students, their satisfaction rate.

Surveys of HSE Center for Internal Monitoring have shown that students are ambiguous about the changes that are taking place in the university. Only 59% of HSE full-time students were fully aware about the details of the recent innovation in HSE educational process – “each student can now add an online course or MOOC in his/her individual curriculum (for example, a course from the Coursera platform or the NOEP). Nevertheless the overall students’ assessment of these innovations has been more positive, as about 71% of students assess the possibility of including MOOCs absolutely positively and positively - pointed 4 and 5 on a scale of 1 to 5, where "1" - these changes for the learning process are definitely negative, "5" - certainly positive (see Fig. 3.).

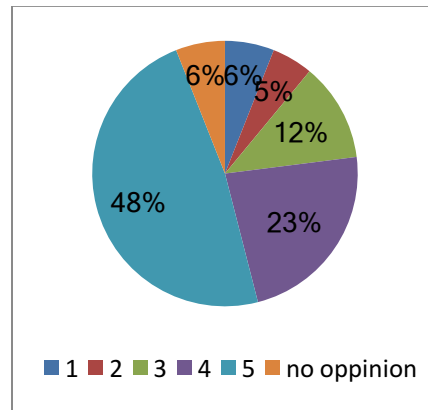


Fig. 3. HSE students’ attitude towards including MOOCs in curriculum

HSE students also noted several important features of MOOCs that distinguish them from the traditional educational process.

- MOOCs give students greater freedom in terms of distribution of their time and flexibility for self-organization of the learning process at a convenient pace. Students who study at the NOEP claim that the weekly deadlines (assignments in many courses for the NOEP should be submitted regularly, and deadline is tough) became an obstacle to them for comfortable studying the course, the tension was greater than in most of the full-time courses.
- In the perception of students, MOOCs are "torn off" from direct communication with the instructor, often students do not receive individual feedback they got used to; clarification of difficult aspects and complex topics took more time than with face-to-face consultations and seminars.
- Also, students noted that in some cases, when MOOCs were integrated in the blended format and accompanied by seminars or practical exercises, the contents of these two parts did not always smoothly complement each other.

3.3 The main challenges to be solved for the further successful use of online courses (including MOOCs) in educational process

Based on the results of the first semester of using MOOCs in HSE educational process, several important topics can be identified that require further study and elaboration to make the use of MOOCs effective and improving the quality of education. They are the following:

- Reliability of exams and other assessments on MOOCs platforms,
- Lack of competent instructors, who could check the knowledge received by students in certain specialized areas,
- No set criteria for assessing the quality of MOOCs.

On Stage 2 of our research we intend to work deeper on the topic listed above and also extend the research agenda to the following issues:

1. Comparative analysis of policies of online learning development in higher education institutions of different countries.
2. Comparative analysis of the formats of online learning integration relevant to universities of different countries.

For the full implementation of the research program we plan to involve partner universities for joint research on the subject.

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