



IntechOpen

Massive Open Online Courses - Current Practice and Future Trends

Edited by Sam Goundar



Chapter

The Content Modification within the Framework of the Massive Open Online Courses (Case Study: International and Russian Practices)

*Aida R. Nurutdinova, Dilyara Sh. Shakirova,
Elvira K. Sabaeva and Nadezhda O. Samarkina*

Abstract

Massive open online courses (MOOCs) are the new form of educational experience that has emerged as a result of the distance learning development as well as the movement to open educational resources. We can talk about the fourth-integrative stage of E-learning evolution, which is based on a complex-virtual training technology. The foundation is the evolutionary way of providing information through the integrated implementation of advanced telecommunication systems enabling any possible transfer of any form of information to any part of the world as quickly as possible. The objectives are as follows: Describe the main strategies of countries' behavior in the MOOC market; analyze the positioning of countries in the international MOOC market; present possible activities in the international MOOC market for Russian providers. The following data sources were used: articles, reports, official documents on MOOC topics, and information from online platform sites; a database of quantitative data collected from two leading online platforms; a database of quantitative data from the Class Central aggregator, which provides information on MOOCs hosted on several large online platforms. This chapter analyzes the features, challenges, and perspective of the evolving massive open online courses in the context of the global information society or the knowledge-based society formation.

Keywords: distant technologies, massive open online courses, e-learning, web education, multimedia module, market research, analytical research, marketing analytics, business development trends, digital economy

1. Introduction

Nowadays, education is an integral part of life and also a quite significant asset. People are educated almost all their lives these days, from an early age, from

kindergarten, to (and sometimes not) varying levels of higher education, continuing education courses or retraining, since science and progress do not stay static, but are constantly evolving. As every year there are new needs that require learning new professions, new knowledge and skills are added to existing professions.

Currently, the system of higher education is undergoing major transformations, which are caused, in turn, by radical social, economic, technological, political, and cultural changes of a global nature. The evolution of knowledge-based economic systems and the emergence of a knowledge society, the globalization and internationalization, the increasing importance of innovative information as well as the communication technologies are among the most important factors that affect the modern university. The dynamic and rapid expansion of information and communication technologies is now becoming a worldwide information revolution, influencing all realms of society (including science, education, economics, culture, management, etc.) and shaping the transition to a new type of society – the information society, or, as it is also called, the “knowledge society”. The information society is a society with the increasing production and use of information and knowledge in all spheres of human activity. One of the major components of this society is its global character [1].

The concept of “information society” first emerged in the second half of the 1960s. The introduction of this term is attributed to Professor Y. Hayashi of the Tokyo Institute of Technology [2]. A number of well-known scientists (D. Bell, E. Masuda, T. Stonier, M. McLuhan, E. Toffler, P. Drucker, M. Castells, A.I. Rakitov, A.D. Ursul, N. N. Moiseev, etc.) have studied the problems associated with the information society. Some scholars believe that the information society is a new societal organization of people, and the processes of its formation have not yet been completed and must pass through several stages. Other scholars, on the other hand, believe that the information society has already been built in some of the most developed countries (the United States Japan, and Western European countries).

Since the 1990s, scholars have begun to focus less on the importance of information itself in diverse society spheres and more on its role, which has given rise to a number of new definitions of post-industrial society: knowledge society or knowledge-based society. At the same time, many experts note the need to ensure open access to information, without which, as N.N. Moiseev stresses, it makes no sense to talk about creating an information society – “a society of planetary collective intelligence” [3].

Therefore, the society which emerges as a result of the informational revolution is characterized by the special status of information and knowledge as the highest and most valuable form of all the gigantic array of information circulating in modern society. The knowledge acquired through open access to information and the ability to work with it becomes the main condition for the well-being of every person and every state [1]. The global trends that have emerged in the XX century will continually have a sequel in the new century, challenging human civilization. Under these circumstances, it is important to be competent to confront destructive trends and to support progressive trends on the grounds of priorities that correspond to the transformed realities of civilizational development. The challenge is highly specific to the educational sphere, which is urged to adjust its priorities considering the needs of human civilization in the XXI century [4].

Rapid development of information technology and ICTs opens up new opportunities and perspectives for improving the education system. This concerns both the improving hardware and HEI’s approach to global educational resources, as well as the use of new ways and techniques, focused on the students’ active cognitive motion. Meanwhile, open educational resources and open distance learning are becoming

particularly significant, facilitating more intensive knowledge exchange, considerably increasing people's access to higher education and lifelong learning, and providing opportunities for international cooperation and the role of universities in the world-wide educational system.

Open educational resources movement began in the last decade of the XX century, and in the year of 2001, it took on a worldwide scale when the Massachusetts Institute of Technology launched the Open Course Ware project, opening up free access to its course materials [5]. At the moment open distance learning courses, based on the usage of educational materials placed in the free access or published under a license that allows their free use, are offered on a free basis by various HEIs.

Since 2008, some online courses have been open to the masses, and the term "massive open online course" (MOOC) was coined in 2008 to describe that type of course. The term was coined in response to George Siemens and Stephen Downs' course "Connectivism and Connectivist Knowledge" held at the University of Manitoba (Canada) in 2008, which was attended by 25 students in the audience and another 2300 online participants [6]. Following this course, several more open online courses were held between 2008 and 2011, registering from several hundred to several thousand participants. The first MOOCs emerged within open educational resources and were inspired by the connectivism concept [7].

In this context, the current trends of Higher Education development in the global world and the university transformation challenges are focused on by many researchers [J.E. Willis, Y. Lincoln, M. Kwiek, P.S. Magrath, B. Brock-Utne, G.Y. Minenkov, etc.]. Challenges of higher education development are considered in the context of the knowledge society formation, in which expanded reproduction and dissemination of knowledge is assumed. Knowledge in the modern world has ceased to be exclusively belonging to the élites and extends to the whole society. Promoting education and learning in a knowledge-based society implies a transformation of the learning paradigm itself, focusing on the person who learns and on lifelong learning. Henceforth, education is no longer a process of transferring knowledge – the focus shifts to the ability of each and every person to learn and to master knowledge independently [8].

The year 2011–2012 can be referred to as a turning point in the development of MOOCs, as the idea of MOOCs finally took hold, first in the United States and then in Europe and other regions of the world. The three courses offered by Stanford University had a record number of participants (about 100,000 for each course) in the fall of 2011. For example, on the course "Introduction to Artificial Intelligence" 160 thousand listeners from 190 countries enrolled and, according to the submitted reports, 23 thousand participants successfully completed it [9]. Starting from that time the rapid development of mass open online courses began, which became the target of countless media publications and vigorous discussions in academic circles, and 2012 was even called "the year of MOOCs" [10]. Starting in early 2012, projects that implement mass open online courses have been rapidly expanding their services in the United States. These include Udacity, Coursera, MITx (later edX), and by the end of the year they are joined by Canvas, UM's Online High School, Udamy, Wedubox, and others [11].

The most popular MOOC providers are the American platforms *Coursera*, *edX*, and *Udacity*, as well as the British *FutureLearn*. National online platforms have emerged in many countries: *XuetangX* in China; *MiriadaX* in Latin America; *France Université Numérique (FUN)* in France; *EduOpen* in Italy; *SWAYAM* in India; the *National Platform for Open Education (NPOO)* in Russia. Therefore, the robust advancement of

massive open online courses is one of the significant trends in higher education in the modern world.

2. Methodology: research design

The research methodology for this study consisted of a review of published research and studies in the field of online teaching and learning, the range of which included literature reviews up to 2022 and empirical studies after 2012. Using a qualitative content analysis approach, this study reviewed 74 published studies and research on online teaching and learning since 2012, mainly focusing on the theory, practice, and evaluation applied to the online learning environment. This paper aims to provide practical suggestions to those planning to develop online courses so that they can make grounded decisions in the implementation process.

According to the findings, the authors state that effective international online learning depends on well-developed course content, motivated interaction between teacher and learners, well-trained and fully supported teachers; creation of a community sense of online learning; rapid technological development. Meanwhile, it is hoped that this will stimulate an ongoing discussion on effective strategies that can enhance the universities' and teachers' success in the transformation to online teaching. Within the current debate on the cost and quality of higher education, this research can help to improve higher education and student enrolment and retention.

2.1 Selection criteria and relevant data sources

The main sources of literature were journal articles and full texts. Motivated by our intention to study the evolution of online education and its impact in the years after 2012. The economic crisis led to a three-stage literature review, starting with pre-2012 literature reviews as the basis of our study in Phase I. Subsequently, using the descriptors of E-learning, Web-based learning and digital learning in Phase II, we conducted a search through empirical studies published since 2012.

On the basis of our initial findings from Phase II, we expanded our search descriptors in Phase III to include MOOC, online courses, and training; computer-based courses and instruction; e-learning, teaching and learning; Web-based teaching, teaching and learning; Internet-based learning and teaching; tele schooling, TV-based learning and tele-teaching; and video curricular learning, tutoring, and learnership.

The primary sources we used for data collection were online databases including ERIC, EBSCO, PsycINFO, ContentFirst, Google Scholar, SAGE Online, Project Muse, Education Full Text, and Academic Search Premier.

For large-scale implementation of MOOCs in HEIs, several questions need to be answered:

1. What are the main strategies of countries' behavior in the MOOC market?
2. What is the positioning of countries in the international MOOC market?
3. What are possible activities in the international MOOC market for Russian providers?
4. What organizational models are used to integrate MOOCs in Russian HEIs?

5. Whether it is effective to use MOOCs to fully or partially replace face-to-face courses, and if so, does this practice lead to a lower educational performance of students?
6. What skills do students need to be successful in MOOCs?

It is pointed out that education is about teaching and learning, and it is also true that what is effective in teaching can be equally applicable to learning. On account of the unique nature of online education, we intended to propose the second and third research questions in such a way that the views of students and teachers on the effectiveness of online education could be taken into account and emphasized.

2.2 Data analysis

Throughout our initial literature review, we began to note that themes of MOOC presence were emerging. We categorized the themes adhering to the theoretical framework developed by Garrison and colleagues, which emphasizes social presence, teaching presence, and cognitive presence in online learning and teaching [12]. We ultimately disaggregated the results into three main themes to answer our research questions, including the evolution of online education, effective methods and practices, strategies of countries' behavior and positioning in the international MOOC market, activities for Russian providers. Therefore, a qualitative content analysis approach was used to review the findings [13].

3. Background and literature review

From the outset, massive open online courses (MOOCs) were seen as a possible alternative to some traditional university sessions, allowing more personalized learning, reducing the course implementation costs, and reducing teachers' workload. With most universities shutting down physically due to the COVID-19 pandemic in the first half of 2020, distance learning became the main possible way not to break the educational process. Therefore, the role of MOOCs in providing quality distance education has increased manifold, as it is almost the only distance format that has been shown to be more effective than face-to-face learning [14].

The distinctive feature of MOOCs as an educational technology is that it can be taken by literally thousands and even hundreds of thousands of simultaneous learners [15]. Consequently, people from different countries and regions have the opportunity to enroll in a course with professors from the world's leading universities. Additionally, the MOOC offers its students, on the one hand, opportunities for communication with both course materials and fellow students, and on the other hand, a certain amount of autonomy in the extent and ways of involvement in the course [16].

According to experts, within the Russian higher education system, the use of MOOCs in the educational process will expand opportunities for constructing individual educational trajectories of students through offering a greater number of courses [17]. Furthermore, it is expected that the integration of MOOCs into university education will help to diversify the learning content, adapt the disciplines to the labor market needs [18], and reduce the educational services cost [15, 19].

In this regard, many experts have anticipated that the development and proliferation of massive open online courses would be crucial for the field of higher education

and would significantly reduce the inequalities in access to high-quality educational resources [20].

The radical attitude was that this educational technology would be “disruptive innovation” for the higher education market by providing a cheap alternative to expensive university degrees [21–24]. Furthermore, a more moderate position was that although universities should consider educational innovations such as MOOCs in their activities, they would not compete directly [25]. Or, even vice versa, some researchers see MOOCs as a way in which university degrees can be outsourced [26].

Some other researchers criticized the idea of the groundbreaking potential of MOOCs from the outset, suggesting that, from a pedagogical perspective, massive open online courses are not innovative and that the fact that they are produced by leading universities and renowned professors does not guarantee high quality and competitiveness compared to conventional traditional university disciplines [27]. In more recent work, there has been a decrease in optimism about the potential of massive open online courses in overcoming educational inequalities, due to the exposure the format has several limitations.

The MOOCs in particular have been criticized for:

1. the low proportion of students taking online courses to the end [28, 29];
2. the persistence of discrimination based on socio-economic status and other characteristics that traditionally have a negative correlation with educational outcomes [30–32];
3. the reduced opportunities for student–teacher contact, and
4. the limited availability of an automated assessment system, which does not always fully facilitate fair grading and feedback [27],
5. the low quality of pedagogical design [33].

Consequently, the possibility of using MOOCs as an alternative to face-to-face education in higher education remains a controversial issue. A number of experts believe that MOOCs would improve the university educations’ quality by providing mass access to courses taught by leading professors from the world’s most prestigious universities [34]. This practice could prove cost-effective for universities, especially for those that cannot offer their students high-quality courses in a number of disciplines [14].

This is already present in a number of Russian [35, 36], and foreign universities in the form of individual initiatives [37]. However, there are also opposing views on the potential of using MOOCs as an alternative to traditional university disciplines. Challenges have been raised about the quality of online courses offered by leading universities compared to face-to-face learning [27]. Hence, despite the potential of using massive open online courses in higher education as a replacement/supplement to some traditional format courses, there are a number of unresolved issues for the large-scale implementation of this practice.

First, the MOOC use cannot be based on the existing models of educational process organization and university economic models, and new ones need to be developed and implemented [19, 35, 36].

Second, it is unknown how the transition to the use of MOOCs as the main or extracurricular material will affect students' knowledge and skills. Will this practice lead to a deterioration of their educational outcomes? How will students react to the new course format? And thirdly, it is not clear to what extent students are ready to take courses in an online format. How can the university help its students to be successful in massive open online courses? What skills can students develop in order to be successful in online courses?

This work is particularly relevant in the context of the urgent transition to online education in Russian HEIs, which took place in March 2020. It will help to answer some of the questions of teachers and staff who are currently forced to restructure their teaching using the online format in HEIs with little or no experience of integrating online courses into teaching.

4. MOOCs overview

The rapid spread of MOOC is due not only to the desire of universities to gain recognition in the international online education market. The possibility of monetizing their projects plays an important role here. Online platforms together with universities offer additional paid certification services, as well as the help of a personal assistant in taking an online course. Gradually, new models of MOOC monetization are being created and improved. In addition, in the conditions of high competition between universities worldwide, MOOCs have become a new tool for promoting the university brand among potential applicants.

Presently, three major university-level online course platforms can be distinguished: *Udacity Inc.*, *Coursera Inc.*, *Udemy Inc.*, and *edX Inc* (all based in the United States).

Udacity Inc. is a private educational enterprise founded by Sebastian Thrun, David Stavens, and Michael Sokolsky, with the expressed goal of democratizing education, providing access to high-quality higher education, and changing the future of education [38]. This project emerged after the successful implementation of the "Artificial Intelligence" course by Peter Norvig and Sebastian Thrun at Stanford University in the fall of 2011. It was a real breakthrough for the whole MOOC movement, since it was after the launch of Coursera, MITx / edX and other projects.

The *edX Inc. platform* is a non-profit academic venture run by the Massachusetts Institute of Technology (MIT) and Harvard University. More recently, it was joined by the University of California at Berkeley, the University of Texas System, the Australian National University, the University of Toronto, and others. The project offers online university-level courses in a wide range of disciplines on a free-of-charge basis [39].

Coursera Inc., a non-profit educational company founded in February 2012 by Stanford University professors Daphne Koller and Andrew Ng, leads the MOOC movement. As D. Koller notes, the project aims to use the best courses of the world's best professors in the leading universities and provide free access to them worldwide [20]. The Coursera project started with the collaboration of four American universities (Stanford, Michigan, Princeton, and Pennsylvania), but very soon other major universities (Johns Hopkins University, California Institute of Technology, Columbia University, Edinburgh University, University of Toronto, and others) joined it. By the beginning of August 2012, the first one million listeners from 196 countries had already been registered [40]. At the beginning of May 2013, the Coursera Web site

offered about 370 courses developed with the participation of 69 partners from diverse regions of the world (North America, Western Europe, Asia, and Australia), and the number of users exceeded 3.5 million [41].

The major outstanding attributes of these projects include the recruitment of professors from the world's top universities, free of charge, and, as a consequence, the massive and worldwide nature (thousands, tens of thousands, and hundreds of thousands of listeners from all over the world). In 2013, the beginning of the year was marked by the advent of massive open online courses in Europe. In February, the leading MOOC platform Coursera announced that 29 universities had joined it, including ten European universities [42]. These include, for example, such renowned universities as the University of Munich and the University of Geneva, the Ecole Polytechnique of Paris, and the Universities of Rome and Copenhagen.

In March 2013, the Berlin-based company *Iversity* announced the launch of a mass online course platform of the same name. Iversity's goal is to convince European academic communities that MOOCs are promising and consolidate universities in continental Europe to create their own mass online courses [43]. Meanwhile, *Futurelearn*, the platform for massive online courses created in December 2012, uniting more than 20 British universities, is gaining considerable momentum in the UK [44].

The first Europe-wide program offering massive open online courses was announced in April 2013. The program was initiated by the *European Association of Distance Teaching Universities (EADTU)*, with the support of the European Commission and the collaboration with partners from 11 countries. More than 40 free university online courses are offered in 12 languages on a wide range of subjects (from mathematics and economics to languages and climate science) [45].

The number of countries, primarily Asian – China, South Korea, Malaysia, today put forward the design of MOOCs, as well as their promotion on foreign online platforms as one of the main strategic tasks at the state level, hoping in the future to create a higher education system highly appreciated by the world community and able to compete with the world's leading educational institutions [46].

As a result of its large working and learning population, China is using digital learning technologies to improve the equity, quality, and efficiency of education. MOOCs became popular in China in 2013 with the launch of *XuetangX*, China's first MOOC platform developed by Tsinghua University.

The Ministry of Education of China and the National Commission of China for UNESCO have launched two online education platforms: *XuetangX* (www.xuetangx.com) and *iCourse International* (www.icourse163.com). Both platforms provide quality educational resources in English and other languages from the world's leading universities and reliable technical support.

XuetangX offers about 3000 online courses from world-class universities, including MIT, The University of California, Berkeley, Tsinghua University, and Peking University [47]. Seven years ago, Tsinghua University created *XuetangX*, China's first platform for integrating and interchange of high-quality MOOCs. The platform has already implemented 2966 online courses with top-notch universities around the world, including Tsinghua University, Peking University, MIT, the University of California at Berkeley, and others. The platform has attracted more than 58.8 million students, and the total number of students who have taken courses is about 163 million. To better serve users worldwide, *XuetangX* released an international version along with 109 online courses in English on April 20, 2020.

iCourse international (www.icourse163.com) was officially launched by China Higher Education Publishers on April 28, 2020. The platform provides online teaching and learning for international teachers and students worldwide. English is the main language of the platform. Launched with accumulated experience in course management and strong technical support from *iCourse* China University, which brings together top-notch universities in China, such as Peking University, Fudan University, and Zhejiang University, the *iCourse* international platform is based on the accumulated experience of course management and the strong technical support of *iCourse* China University. The platform provides 193 courses in English.

According to the Chinese Ministry of Education, there are more than ten MOOC platforms in the country, and more than 460 universities and colleges have introduced more than 3200 online courses through these platforms, which are watched by more than 55 million people. In addition, more than 200 Chinese online courses have joined international MOOC platforms. The Chinese online education market is developing under rigid regulatory conditions on the part of government supervisory structures, and the private players' expectations for the continued development of the Russian education market and its online segment, following Russian President Vladimir Putin's instruction to review the issue of the establishment of government regulation of the rotation of informational products for children placed in the info-telecommunications network Internet and use in the sphere of distance school education in Russia, are exceptional.

Russian universities are also actively developing and using online courses. However, there are few works that would investigate the MOOC market and its prospects in Russia. One of them is a study of the Russian market of online education and educational technologies conducted by *Netology Group*, but it examines the development of online education in general and does not describe in detail the international MOOC market. Other works by Russian authors concern the history of the creation and development of the MOOC, but do not explore the role and prospects of Russia in the international MOOC market [48–52].

In countries such as India, Australia, and many other Asian countries, MOOCs are becoming part of the education system, which is expected to boost the science segment. The MOOCs have gained popularity in India for more than half a century among students and professionals, especially in technology and engineering, who have struggled to improve their skills in the ever-changing and disruptive world of technology [53]. Therefore, platforms such as SWAYAM offer 155 engineering courses and 108 science courses [53]. Moreover, many companies claim that the recent COVID-19 outbreak and quarantine in many countries have dramatically increased the demand for science MOOCs. According to a 2019 Class Central MOOC report, India invested more than \$33 million in SWAYAM. In the place of this high cost of the platform being open, SWAYAM courses can be taken for free. In addition, India has increased its enrolment in higher education to 30 percent by 2021. According to Coursera, out of 35 million users worldwide, India has the highest number of students on the Coursera platform.

In April 2020, EPFL and the Mohammed VI Polytechnic University (UM6P) in Morocco launched the new online learning portal featuring 41 MOOCs developed at EPFL. The platform is the first result of a partnership deal struck between the two institutions shortly before the COVID-19 outbreak. In addition, at the time of the lock-in, the university reported that the program was attracting many students from the rest of Morocco's engineering schools.

The University of Cape Town (UCT) has recently seen a surge in participation in MOOCs since the start of the global lockdown. More than 10,000 people enrolled in “Understanding Clinical Research”, the course focused on gaining knowledge in medical statistics, in response to the COVID-19 pandemic. As of March 2020, “FUN” (France Université Numérique), the MOOC platform that dominates the French online course ecosystem, announced that a total of 31 MOOCs will be offered during 2020, divided into two collections: “ProjetSUP” and “RéussiteSUP” [10, 45].

5. International and national MOOC market

Massive open online courses, implemented with the cooperation of the major universities in the world, are developing dynamically on a global scale, expanding access to higher education and lifelong learning for people from all over the world and having a significant impact on the modern system of higher education.

Universities and other organizations from around the world that produce online courses in different languages are represented on the international MOOC market. The subjects of such a market are manufacturers of online courses from different countries and consumers of online courses around the world. Unlike the international market, providers of one or several countries that produce MOOCs in the state language are represented on the national market; for example, courses are placed

- on *MiríadaX6* in Spanish,
- on *FUN7* – in French,
- on *XuetangX8* – in Chinese,
- on *NPOO* – in Russian.

The subjects of the national market are producers of online courses in one or more countries with the same state language and consumers of online courses who are native speakers of this language. The creation and development of national platforms, as a rule, is subordinated to local goals. For example, the *FUN platform* distributes educational products of French providers.

Depending on either the international or national MOOC market across countries, two behavioral strategies for establishing and promoting online courses can be distinguished. In determining the market behavior strategy, the following sources were used:

- the official Web sites of the leading platforms (to assess a country’s market behavior strategy for MOOCs through its providers that host MOOCs on online platforms);
- official Web sites of national platforms that host MOOCs;
- articles and reports describing the country’s providers’ actions in the MOOC market (keywords such as “MOOC”, “online course”, “platform”, “developing

country”, “developed country”, and country names were used when searching for articles/reports);

- official documents that outline the country’s (its providers’) strategy of behavior in the MOOC market.

The First strategy involves positioning and promoting the country on the international MOOC market by creating and posting online courses on platforms whose users are citizens of different countries of the world. The leading international providers include the major American platforms *edX* and *Coursera*, which collaborate with institutions/universities from other countries¹ and which represent the largest number of students from different countries².

The Second strategy is the advancement of online education in the national market to solve regional problems. National platforms and/or resources of the leading providers can be used for its implementation. For instance, in the European region, MOOCs are used to ensure inclusion, to develop language and entrepreneurial skills, and focus here on the development of migrants’ skills, which will enable them to gain access to the labor market.

The First strategy is used mainly by countries in the Asian region (Malaysia, South Korea, and Japan), a number of European countries (Denmark, Sweden, the Netherlands, and Italy), and Arab countries (Egypt and Saudi Arabia). Within the scope of this strategy, online courses in the international language (English) in various subject areas, including courses from academic programs, and MOOCs focusing on the history of the country, its cultural characteristics, and language learning, are being created.

For instance, South Korean universities place English-language courses on international platforms for Korean language learners (“Learn to Speak Korean-1”), MOOCs on Korean history and politics (“Modern Korean History: Liberation, War and Nuclear Ambitions”) [54].

Universities in Japan have designed MOOCs on Japanese culture (“An Introduction to Japanese Subcultures,” “Visualizing Postwar Tokyo”) as well as a course on the characteristics of enrollment and university education in Japan (“Studying in Japanese Universities”) [55]. Strategy for the Development of the National Education System through the creation and expansion of the national universities’ MOOCs on leading platforms can be enshrined at the state level. However, it is not a strategy that can be implemented at the national level. As an example, in Malaysia, the Ministry of Higher Education in 2015 developed a national strategy for the online courses production and support, which aims to increase the brand awareness of the country in the global space [56].

According to this strategy, the first phase identifies the key areas in which the creation of high-quality MOOCs is expected, establishes partnerships with leading platforms, identifies free segments, and launches a national e-learning center responsible for coordinating MOOC creation and its promotion on the platforms [57]. Furthermore, at this stage, training programs are developed for the personnel who will create and maintain the MOOCs, and procedures are formed for re-crediting the results of MOOCs to integrate them into the curricula.

¹ Coursera platform has partnerships with 164 educational institutions from 29 countries.

² At the end of 2017, the total audience of Coursera and EdX reached 44 million users

In the second phase, MOOCs are established in selected core areas. The Malaysian government expects at least 15 online courses from each university to be hosted on leading platforms. Today, highly specialized courses in English from Malaysian universities, such as Malaysian Taxation, Naval Architecture, and Ship Building, are already available on the *OpenLearning* platform (The OpenLearning platform is an Australian provider of open online courses and hosts courses primarily from Australian and Malaysian universities).

At the third phase, progress in the strategy is evaluated, and, if necessary, adjustments are made. The Ministry of Higher Education of Malaysia expects that the creation of specialized MOOCs and filling the vacant niches on the leading platforms will allow, first, to increase the share of foreign students among the students of Malaysian MOOCs to 30% by 2022, second, to gain recognition of the Malaysian higher education system and achieve its inclusion in the top 200 Webometrics rating, third, to reduce the cash costs of course creation and get support from the providers themselves [57].

The Second Strategy in the MOOC Market is aimed at solving the state's objectives, and national platforms or the resources of leading providers can be used in the absence of financial and technical capabilities to ensure the functioning of their own platforms. The emergence of the national platform does not automatically lead to the disappearance of the online courses of universities in the country from the leading platforms, and the universities continue to position themselves internationally and prepare courses in a foreign language for foreign audiences. Both international and national platforms host their online courses, including the United Kingdom, France, China, India, and Russia.

The national platforms primarily offer MOOCs that are recorded in the national language and meet certain requirements in terms of subject matter and format. As a rule, the content of online courses is dictated by the demands of the national labor market and the demand of applicants and students. For example, most of the online courses posted on the Chinese platform *XuetangX* in Chinese are focused on engineering [58]: Engineering majors are most in demand among students at universities in China [59].

For example, the unified strategy for online course creation and hosting on India's SWAYAM platform [53], prepared by the Department of Higher Education of the Ministry of Human Resource Development of India in 2017. The distinctive feature of the strategy is the creation of an academic council that reviews applications for the design of online courses.

The Ministry appoints the national coordinators responsible for creating MOOCs for all levels of education. For example, the Consortium for Educational Interactions creates online courses for the undergraduate level, while the National Council for Educational Research is responsible for creating online courses for the secondary school level. The SWAYAM platform offers MOOCs that are part of educational programs and mandatory for students, as well as MOOCs aimed at developing further professional skills, which are offered to all interested users and are not mandatory to study.

State strategies for the formation and development of national platforms are being developed in some countries. Those countries that do not have the resources to create and maintain national platforms are benefit from the leading platforms where universities post MOOCs in the national language. The leading providers for hosting online courses in the national language are Latin American countries (Brazil, Chile, Colombia, Argentina, and Mexico), Norway, and Turkey.

Norwegian universities, for example, mainly use the resources of the English provider FutureLearn to promote their own MOOCs [60, 61]. The Norwegian government only finances certain local demands for MOOCs from universities and their students, so all MOOCs from Norwegian universities are created in Norwegian and are

provided to students for free, with the possibility of course credit if they receive a positive evaluation at the end of the course [61]. Therefore, the country uses MOOCs in the educational process offered by its universities without financial resources invested in the national platform.

The Russian universities and other organizations host their own online courses both on the leading platforms and on national platforms. At the beginning of 2018, 259 courses were posted on the National Open Education Platform. Under the current conditions, the advantage is given to large market players with significant financial resources, which leads to the displacement of less financially secure market participants from the market, to the activation of collaboration, mergers, and acquisitions. The MOOC market in Russia still has an extremely insignificant share in the total volume of the global market [62],

- 21 billion rubles in 2016,
- 30 billion rubles in 2018 (about 10 billion rubles was earned by the “Top 35 EdTech”),
- 47 billion rubles in 2019 (about 14 billion rubles was earned by Top-70 EdTech),
- 53.3 billion rubles in 2020 (about 34 billion rubles of revenue came from TOP-60 EdTech),
- 73 billion rubles in 2021 (Top 100 EdTech revenue).

Unfortunately, the share in Russia is still very small. Nevertheless, platforms such as edX and Coursera had been popular in our country as well. Coursera accounts for more than half of all Russian traffic. This platform is a world leader, as it cooperates with more than 149 universities worldwide.

The annual growth of the online segment of the Russian education market was about 40% on average from 2016 to 2021. According to the IT holding “TalentTech”, by the end of 2021, the track share in the further adult education in the online segment was already about half of the market volume, about 26% accounted for vocational school education (below the projected values), and 18% occupied higher professional education. The share of higher professional education in the overall structure of the MOOC market has decreased more than previously expected and predicted.

The demand for programs of individual segments of the direction of further online education for adults, according to the results of 2021, compared with the data of 2019, has practically not changed. The most popular programs of further education among adults in 2021, as well as in 2019, were programs in the field of information technology, business management, sales and marketing communications, as well as design. Basically, only the percentages of their share presence in the total market volume have changed – there has been the indicators alignment of the previously lagging segments relative to the indicators of the major directions. With one clear exception, the *Open Education* platform segment has become one of the leaders in the MOOC market of the Russian Federation.

The development of online learning technologies for several years has had a significant impact on the education transformation as a whole, altering its structure by changing the demand structure, forming new, already irreversible trends in its further transformation. Via the example of the revenue growth of the top ten educational services of the Russian MOOC market in the second quarter of 2020, it can be seen

that the increase compared to the same period in 2019 ranged from 24–625% [4], while the revenue growth of the five market leaders, who had already demonstrated significant revenue indicators a year earlier, on average for the second quarter and by the end of 2020, it amounted to over 150%.

The world MOOC platform market will register an average annual revenue growth rate of 39.8% in five years, and by 2026 the volume of the global market will reach \$29,360 million [63]. Several independent surveys show that European and American institutions of higher education are more actively involved in MOOCs than Russian institutions of higher education. European and American universities have a more positive attitude toward the development and implementation of MOOCs. There is also no information about the effectiveness of the integration of such MOOCs into the educational process of Russian universities.

However, Russian platforms work and have their own dedicated subscribers (see **Figure 1**). For example, the Russian Platform *Open Education* (1.2 million visitors per month according to SimilarWeb) is three times behind Coursera. However, considering that it was launched in 2015, the second place can already testify to quite effective development dynamics. Currently, the main players on the MOOC market for the Russian higher education system are as follows:

- *The National Platform for Open Education* [<https://openedu.ru>] offers online courses in the core academic disciplines studied at Russian universities. The National

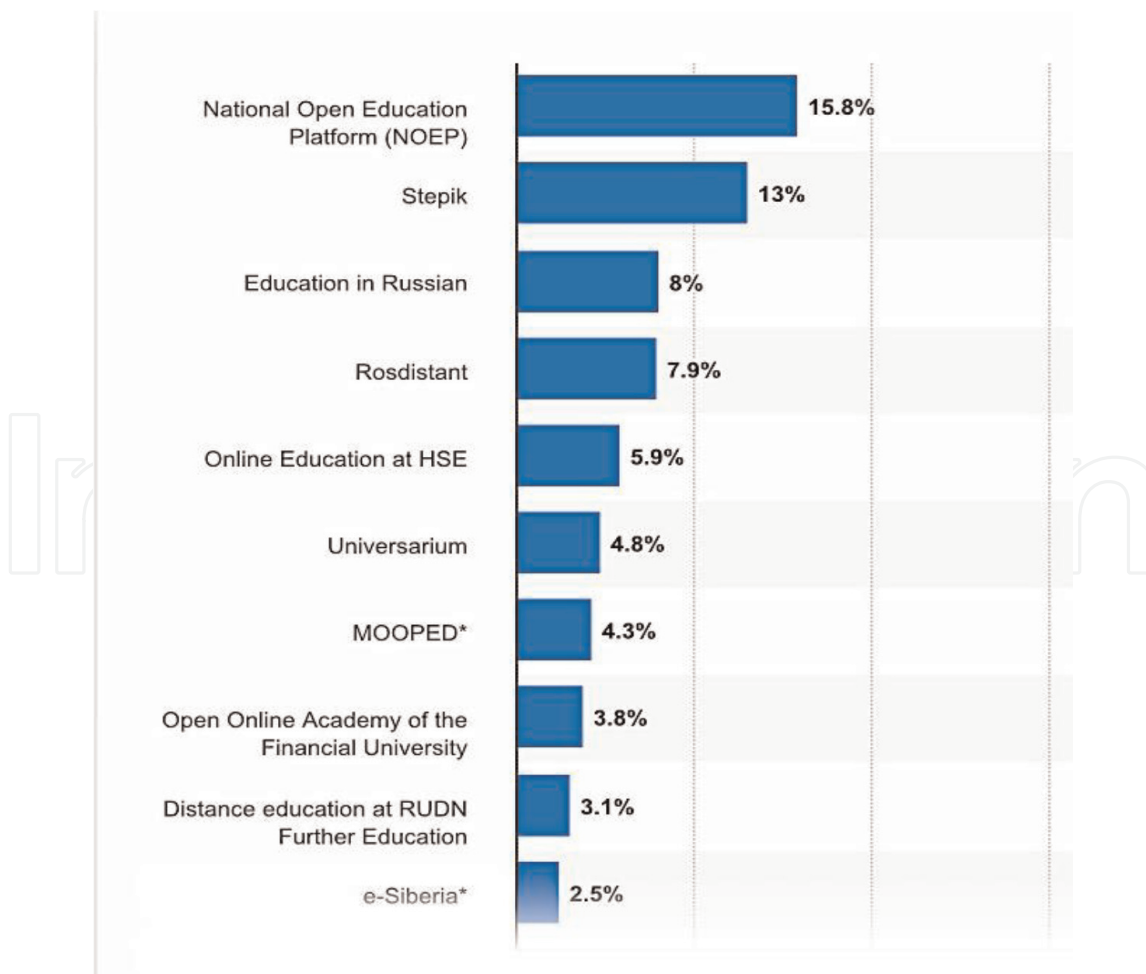


Figure 1. MOOC platforms used by universities in Russia 2021 [64] (Distribution of online courses published by HEI in Russia as of by October 2021).

Platform for Open Education Association is approved by the famous universities: SPbSU, ITMO, NRU “Higher School of Economics”, NITU “MISIS”, SPbPU, MIPT, UrFU, and Moscow State University. These courses have all been designed by leading Russian universities and are available free of charge and without any formal background requirements. At openedu.ru you will find more than 230 online courses in physics, chemistry, marketing, history, and other subjects.

- *Universarium* [<https://universarium.org>] is an open platform that provides free courses and academic programs by Russian universities and research and business experts.
- *National Open University “Intuit”* [<https://intuit.ru>] is focused on providing open and free access to courses in the following disciplines: information technologies, mathematics, physics, economics, management, etc.
- *Lectorium* [<https://www.lektorium.tv>] is an educational platform that combines a MOOCs hosting platform, a core publisher for MOOC development, and an open Russian-language archive of videotlectures.
- *Stepik* [<https://stepik.org/catalog>] is an educational platform that offers open access to online courses, as well as an opportunity to create your own educational course for any registered user, using videos, texts, and assignments with automatic testing and instant feedback.
- Moodle Open Education (*MOOPED*) [<https://mooped.net>] is the online education portal of the Volga Regional Center for Educational Cooperation, created at Volga Tech. This portal’s main objective is to provide a platform for educational enterprises, companies, and government agencies to create and promote online training courses in the educational space.
- *E-Siberia* [<https://online.sfu-kras.ru>] is the online learning platform of Siberian Regional Center for Social and Cultural Studies. E-Siberia online learning platform is the element of scientific and educational network of “Yenisei Siberia” regions, including Krasnoyarsk region, Khakassia and Tyva republics. This platform is aimed at fostering online learning, supporting the implementation of educational programs and projects that provide solutions to the strategic objectives for regional progress, taking into account the possibilities of the digital revolution. This platform was launched in 2018 and is maintained by the Siberian (Krasnoyarsk) Regional Center of Competences in Online Learning on the basis of the Siberian Federal University.

Also, there are specialized sites: *Lingualeo* is a leader in teaching foreign languages with 13 million users, *Geek-Brains* gives knowledge in teaching programming. Other examples include the *PhysicalTech Lecture Hall*, *ITMO courses*, *Total Dictation*.

6. Current trends and prospects of MOOC market development in Russia

The Russian Federation is one of the top ten countries in the world where there is the greatest interest in online courses [64]. It is not surprising that the so-called

MOOC platforms, where mass online courses are held, are gaining ground. Even though they have not yet become a real alternative to the traditional educational process, in a reality where accessibility, mobility, and an innovative approach are of great importance to learning, MOOC platforms definitely have a future [63, 65]. The development of MOOCs in the world has certainly accelerated significantly because of COVID-19. With the pandemic, consumer behavior has changed in all walks of life, and the major global MOOC players saw a 1000% increase last year [63].

In other respects, however, MOOC platforms in Russia still require a significant amount of advance in public interest, despite the fact that by joining these platforms one can study practically everything from computer science to transcendental poetry. The major obstacle to outreach to those who do not yet have access to education has little to do with access to technology. More likely, it is a common unawareness that there are free and inexpensive courses available.

When we talk about MOOC market, in particular about the capacity of the Russian market, we mean its hypothetical estimated value (the calculations consider the current number of potential consumers, the average cost of products and services, as well as the potential for the market development, considering available statistics and forecasted changes in demographics, and demand and sales volumes). The general trend of further development of the MOOC market in Russia is the *transition*, especially of private business from digitization (digitalization) of offline educational programs, and the creation of new training methods and tools, which is substantiated by the demands of increasing competition between market participants.

The user has already been “fed up” with the pseudo-innovative format of online education, felt the effects of marketing deception, including low quality service and communication support, discrepancy between advertising promises and learning outcomes, replication and repackaging of irrelevant training programs, faced with low-quality and simply outdated educational products.

New solutions and approaches, new methods and tools, new market players, who will probably be able to improve the quality and efficiency of educational programs and bring the education market to a higher quality level, are required in the emerging but already highly competitive MOOC market in Russia [62].

Nowadays education should provide novel experiences, prompt visual results, new social interactions, and the possibility to apply and consolidate the acquired knowledge and skills in practice as quickly as possible. Artificial intelligence, machine learning, big data, game mechanics, automation, microlearning, gamification, and virtual and augmented reality (AR/VR) are the education market development trends that “lie on the surface”.

The formation of the combinatorial configurations of these trends is the way to form a new, modern, relevant, innovative education. Leading trends in the future education system are associated not only with the search for new learning formats, but also new roles for all participants in the educational process.

Continuing Education, or Lifelong Learning. The concept of Lifelong Learning is not an unreasonable one in the rating of educational emerging trends of the future. In fact, it appears to be a necessity, without which it is impossible to imagine the quality of modern man’s life. Technology is updated at an incredible speed, new information is emerging, people are being replaced by robots, and the need for previously unknown professions is growing. All this makes us constantly being trained, just to sustain the necessary proficiency level.

Full digitalization. Digitalization is another important tendency in present-day education that is sure to stay with us for a long time. The phenomenon includes not

only the transfer to distance learning, but also the increasing role of mobile technology and the emergence of a new digital world for students. Globalization and the substantial student growth are the main reasons why learning is shifting to the digital world. For universities, it is much easier to launch courses online than it is to enroll everyone who wants to study face-to-face. However, it is also good for international students, who no longer have to travel huge distances to get a degree from a prestigious university.

Massive open online courses (MOOCs) are more effective than the previous two. Massive open online courses have effectively accomplished two tasks:

- provide access to up-to-date education to the largest possible number of people;
- facilitate an open and interactive process of learning.

Educational platforms like this, where courses from even the most prestigious universities in the world are available, are not only abroad, but also in Russia. For example, on a single MOOC platform, you can find modern study programs in data analysis, design, marketing, IT development, English and management. You can even find free courses and courses for children.

Gamification. “All the world’s a stage, and all the men and women merely players; they have their exits and their entrances” – Williams Shakespeare’s words in the XXI century take on particular importance, since now the game becomes an essential educational element [66]. A special term – Edutainment – has even been coined, combining the concepts of “education” and “entertainment”. Edutainment is the practice of involving children and students in the learning process, developing creative thinking, “soft skills”, which are so important in today’s world, as well as finding ways to interact with the other participants in the process [66].

Virtual and augmented reality (AR/VR). Gamification logically leads to another tendency – the use of virtual and augmented reality technologies. These allow us to look at the educational process in a novel way and make it more three-dimensional and captivating. Techniques of virtual reality not only increase the illustrative value of the studied material, but also extend the perception boundaries, helping to bridge the gap between theory and practice as closely as possible. VR and AR technologies’ effectiveness is confirmed by various experiments that are actively conducted both abroad and in Russian institutes [67, 68].

Dynamic Design Processes. With modern technology, we can access any information in one click. At the same time, real life and business do not depend on theoretical knowledge, but on skills. These two factors require a profound restructuring of the educational process. Therefore, students’ independent work is becoming increasingly important. Currently, they can find the required information before the study session and do their own research. Faculty members spend considerably less time on explanations and more on organizing group interaction and collaborative project work [69]. The emphasis is on case studies, problem solving, project development, brainstorming, and creative solutions [48]. The benefits: get a real-life hands-on experience; practice the skills they have learned; practice the obtained knowledge and skills; improve information absorption; participate and collaborate with others; maintain a high-level motivation for learning. Projects are a great alternative to boring lectures, after which students graduate from their alma mater feeling more motivated and prepared for real life [8].

Agile and Scrum technologies. Modern tendencies in educational process include not only new formats, but also new strategies and approaches to the organization methods. The implementation of Agile and Scrum technologies is one of them. Agile and Scrum in education enables the educational process to be divided into short segments, to enhance project teamwork and to monitor the training results. Agile methodology teaches university students to provide themselves with continuous feedback, handle each stage responsibly, and maintain high motivation. And considering that Agile and Scrum are, as a rule, the main methods of work in IT-companies, students acquire beneficial skills, which will definitely be useful for rapid professional growth.

The adaptive learning. The adaptive learning is increasing in importance all around the international world. The idea that education should be adapted to the student's needs has been known since ancient times. However, this idea became truly real with the development of artificial intelligence. The adaptive systems allow to set up the most individualized trajectory, considering the cognitive features of the student, his/her perceptive methods, and the initial level of training. Currently, adaptive programs have their limitations: they are not very suitable for the humanities and those areas that are subject to constant change. But these are areas for further technological development.

Integrated Approach. The integrated approach in both education and life implies interdisciplinary learning. Within traditional medicine, disease is a physical condition that must be treated with medication or surgery. The specialist who uses the integrated approach considers the disease not only from the perspectives of the physical body, but also considers the mental state of the patient, his or her relationships with others, family history, and is aware of alternative therapies. It is worth thinking about the multidisciplinary skills that will allow us to understand the subject from different perspectives if you want to be a truly in-demand specialist.

Shifting the teacher's role and chatbots. The important tendency that will only increase over time is the changing role of the teacher. He or she is no longer the only knowledge provider. Now, he becomes a facilitator who creates and supervises the educational process. On the educator's shoulders fall such tasks: engaging students in learning; keeping them motivated; devise and manage interactive projects; train how to think and critically perceive information. So who will do the assessment of knowledge? So far, this is also the task of the instructor. There are already services for developing chat-bots, which can automate the process and facilitate the teaching work.

Certainly, these are not all the novelties that are already actively used in education. But regardless of what technology comes into our lives, tests, term papers, thesis, and other types of work will definitely be part of the educational process.

7. MOOCs challenges

The MOOC is called "the most crucial experiment in higher education," and this form is beneficial for the teachers and educational institutions themselves – it is sufficient to record the course once, the information does not need to be duplicated, and no personal presence is required. For those who take the courses, the benefit also seems obvious: They can be taken online, at any convenient time from anywhere in the world.

Currently, though, the MOOC market in Russia is stagnating. This applies both to educational products created by various universities and to those produced by independent third-party market players. Based on the expert estimations only a small part of leading Russian universities purchases such courses in significant amounts – about 20 million rubles a year [70]. In the next few years no significant growth in the number of mass open online courses for students of higher educational institutions is expected. One of the reasons is the lack of funds for the purchasing of these educational products and the lack of university administrations' interest in creating courses for the long-term and with a more strategic outlook. It is difficult for organizers to monitor the real progress made by students, to evaluate their involvement and their motivation, and to support them in timely manner. The major problem with MOOCs is that they are impersonal.

Although there are few practices of MOOC integration [35, 36] there is currently a legislative framework as well as the first successful examples. For example, Ural Federal University (UrFU) has become the first university in Russia to undergo state accreditation of educational programs incorporating various models of online course integration. In accordance with Article 15 of Federal Law No. 273-FZ dated December 29, 2012 "On Education in the Russian Federation", some educational programs can be implemented within network forms of implementation using the resources of other organizations in the MOOC format [71].

However, the lack of widespread application of MOOCs in higher education can be explained by several reasons.

First and foremost, this practice requires a restructuring of both the educational and administrative processes of the university [72]. To begin with, the university should have staff or separate units responsible for supporting students' online learning and monitoring the results of the learning process. The important aspect here is the change in the management of the university's teaching staff. For instance, by replacing an academic discipline with MOOCs, teachers are freed up their working time, which can be used for research activities [73]. It is worth noting that at the moment there are discussions on the time reallocation of university teaching staff due to the replacement of face-to-face courses with MOOCs.

Secondly, in order to re-credit the MOOC learning outcomes, it is necessary to adopt additional normative documents, which regulate this process. This would imply verifying the content of MOOCs, as well as the validity of their certificates [19]. Finally, the functionalities of the online platform providing MOOCs should allow students and teachers to track the learning process of the course [35].

Currently, three types of integration models of online courses into the educational process can be distinguished in the Russian higher education space [74]:

1. integrating MOOCs into a blended learning format;
2. replacement of the part of face-to-face courses of an educational program by online courses;
3. creating an online Master's program in which all courses are delivered in MOOC format.

As a rule, there are thousands of students who sign up for one section with one instructor. Occasionally the instructor is not even the one who created the course, and sometimes there is no instructor at all. Assignments designed to be more interactive, such as group discussions, can enhance the impersonal nature of these large courses.

In some subjects, especially those that are difficult to learn, such as math or science, this is not a major problem. However, arts and humanities courses are traditionally based on in-depth discussion and debate. Students often feel they are missing something when they learn in isolation [72]. For traditional classes, teacher interaction feedback is not just about ranking students. Ideally, they would be learning from the teacher's feedback. Unlike most MOOCs, unfortunately, it is impossible to get detailed feedback. Most instructors teach for free, and even the gentlest are simply not able to correct the hundreds or thousands of papers per week. Occasionally, MOOCs provide automatic feedback in the form of quizzes or interactives. However, without a tutor, some students make the same mistakes over and over again.

The high number of students on MOOC platforms can also be misleading. It can be very easy to get a class of 1000 when enrolment is just a few clicks away. Individuals find out about open courses through social media, blog posts, and sign up in just a couple of minutes. But they soon fall behind or completely forget that they are taking any course at all. On many occasions, this gives the student a chance to try out a course without any risk. But for some students, this means that they simply cannot handle the course on their own. Not all people are goal-oriented internally; some succeed only in a more structured environment with set deadlines and personal motivation [74].

The MOOC platforms do face serious problems, especially when regarded from the perspective of a new tool in higher education. The greatest threat to the continued existence of MOOCs, however, is the significant cost of creating excellent courses and the low probability that these costs will be quickly recouped, at least under the current revenue models of platforms in Russia [75].

There are several solutions to this problem. For example, MOOC platforms can create new revenue streams by offering training solutions to corporations. They can also charge more for professionally oriented courses and use that to subsidize their other offerings. Operating on the other side of the equation, universities can use various methods to reduce the production costs to create new platforms. Automating the MOOC process and training faculty can create new courses quickly and affordably, even with a small staff.

Finally, the government can get involved in the development of MOOCs. Some countries are already engaged in funding national platforms (examples include the French platform FUN or Israel's Campus-II). The Russian government starts investing in MOOCs so that platforms remain free. And the government has also made itself known [71]. The company "Rostelecom", on the technology platform of the social network "Vkontakte" group of companies "VK", has created and modernized the online platform for education and communication of high school students "Sphereum". In any case, if such support does not happen, the user will pay for everything. In the future, MOOC platforms will learn to better monetize their content, of which there will definitely be more.

7.1 Case study: high-priority project "Modern Digital Educational Framework in the Russian Federation"

Each year the information society is expanding. There are currently a large number of online learning and credentialing platforms, but, unfortunately, the existing diversity of courses is nowhere to be found in a centralized way. Generally, online courses are placed directly on the site of the educational institution, which implements and maintains them, and the participant, who is not a student of this institution, has no access to the presented list of online courses. Addressing this problem, a priority

project “*Modern Digital Learning Environment in the Russian Federation*” [62] was initiated, the main concept of which is to provide access to online courses, developed, and implemented by a variety of institutions on multiple platforms of online learning, to all categories of people and educational providers at all educational levels. This portal is designed to address the following challenges [64]:

- Implementing unified authentication using the “unified identification and authentication system”.
- Conducting a course search in the directory of online courses, an aggregator of online courses of different platforms.
- Performing quality assessment of online courses.
- Execution of online courses ranking.
- Generating digital student portfolios and recognition of online learning results by educational organizations and employers.
- Integrated authentication system using “unified system of identification and authentication”.

Implementing this challenge will allow users to authenticate themselves on the Portal, using the accounts in the state information system “unified system of identification and authentication”. Unified authentication technology makes it possible to use a single login on the portal, information systems of educational organizations, and various online learning platforms. Consequently, after a user has been successfully authenticated on the portal, when trying to navigate through the content of an educational institution’s online course on an existing online learning platform, no login to that system will be required.

7.2 Online course registry

The Online Course Registry subsystem collects and displays up-to-date information about online courses posted on various online learning platforms, including their main attributes and settings (course title, course description, link to the learning platform where the course is hosted and the competencies to be formed). The Registry enables the categorization of online courses and supports their versatility in order to maintain the online course modification history. An important function of the Registry is the automated data exchange with educational organizations’ information systems, online learning platforms, and the other informational systems about the online courses available for study.

7.3 Quality assessment

The “quality assessment of online courses” module ensures the preliminary compliance analysis of the published online courses with the minimum requirements of the system, the quality assessment, and its content by the experts. The expert review is formed by the multitude of rankings, assessed for their compliance with the accepted criteria (course effectiveness, practical relevance, in-depth development, interactive elements, instructor status, the possibility of broader use of the results,

societal relevance, etc.). The online courses may also be assessed by the participants who have completed the courses. Therefore, this sub-system allows the accumulation and storage of evaluations of quality, validated by experts and participants of online courses.

7.4 Online course rankings

On the basis of the online course rankings indicated by experts and participants, as well as on the similarity level of the considered at a particular moment online course with other online courses placed in the Registry, the calculated rankings of online courses are carried out. An algorithm for comparing competencies and learning outcomes, online course ranking visualization modules, as well as the storage of the rating history to ensure the data integrity at any point in time are used to ensure the correct calculation and display of rating values.

7.5 Digital portfolio

On the “Russian Federation’s Modern Digital Learning Environment” portal, everyone has the opportunity to create their own digital portfolio, which they can share with employers and academic organizations. This digital portfolio is integrated with various online learning platforms, and university and employer information systems, and enables users to view their results for online courses, Olympiads, accomplished projects, register their full academic records, generate a CV including the results of online courses, certificates, personal achievements, and educational background information. Each user can also specify and confirm the information about their work activity and career achievements, view certificates earned and the completed training activities, as well as receive appropriate feedback on personal development, career opportunities, and trainings.

7.6 Case studies of the Russian EdTech start-ups’ launch and development

7.6.1 Case study: EdTech

EdTech literally translates as “educational technology. Do not confuse it with the distance-learning technology that pampered parents during the pandemic. This is more than that online courses, learning enhancement, and training platforms all in a single bottle. The EdTech companies compete with each other by the presence of certain methods and tools. These enable you to obtain a high-demand profession, such as developer, marketer, or designer, in a matter of months. However, this is not the only advantage of *Edtech*.

In the current environment, the priority is given to large market players with significant financial resources, resulting in the displacement from the market of the less financially secure market participants, to the intensification of the collaboration processes, mergers, and acquisitions. In the period from 2015 to 2021, several large *multistructural EdTech conglomerates* were formed in the online education market of Russia as part of consolidation and consolidation, with total revenue of over 32 billion rubles in 2021. (44% market share of top 100 EdTech companies [30]). (see **Figure 2**).

Leading market player in online education in 2021, *VK Group* (former Mail.Ru Group), which includes *Skillbox Holding* (*Skillbox*, *GeekBrains*), *Skillfactory*, *CASPA*



Figure 2. Annual Russia and CIS EdTech 100 recognizes the most promising EdTech innovation start-ups based in the region across the market [30].

(English language school), “Uchi. Ru” (“TutorOnline”, “CodeClass”, “Your Lesson”, “YaKlass”), “Algorithmika” (children’s programming school), “Tetrika” (online preparation for the EGE and OGE and classes in school subjects), “Umskul” (online school exam preparation), and the Brazilian language school “Mentorama”, 90% of the share of which is owned by “Skillbox”. The aggregate revenues of the group of companies “VK” in 2021 amounted to about 17 billion rubles (23% share of the total market share of online education of the top 100 EdTech companies) [64].

Group of companies “Skyeng” includes “Skysmart” (children’s segment) and the online university “Skypro”, which runs the programming school “Kodium” and the online marketing and design school “QMarketing”. The second major multistrukture market player, with revenues of about 10 billion rubles in 2021, is a multistrukture player with a 14% share of the total market of online education in Russia (top 100 EdTech companies) [30].

IT-holding “TalentTech” includes: “Netology”, “Foxford”, “EdMarket”. The third major multistrukture market player by enterprise turnover, with revenues of about 4 billion rubles in 2021 (5% share of the total market of online education of the top 100 EdTech-companies) [30].

The company “Yandex” with the online platforms “Yandex.Practicum” and “Yandex.Tutorial” with revenues of about 4 billion rubles in 2021 (5% share of the total market share of online education) divides with IT-holding “TalentTech” in honorary third place.

It is necessary to note separately the activity of “Ultimate Education” company founded by “Ultimate Capital” investment fund in 2020 and incorporating EdTech projects in the following areas: design (*Bang Bang Education*), marketing (*MAED*), gamedev (*XYZ*), psychology (*Psychodemia*), and fashion (*Fashion Factory*).

The Company, with a relatively low, in comparison with the large EdTech conglomerates, the total revenue for 2021 in accordance with the official financial statements of about 500 million rubles, represents a promising multi-structure market player who owns a well-balanced portfolio of investments with high growth potential [64].

The Russian companies actively continue to expand into the international market. Besides start-ups initially created as international, “NovaKid”, “EBAC Online”, “MEL Science”, “Edstein”, “SpeakerGuru”, “Diductio”, “BeSavvy”, “Vectorly”, “Hinted”, “IntellectoKids”, and others, more than a quarter of the top 35 Russian EdTech companies already operates abroad, and investments into the international expansion the Russian educational online projects are a major investment trend in 2021.

The international market for online education already includes “SkyEng” (operating in Spain since 2019), “Skillbox” (in 2021 gained a 90% share in the Brazilian online school “Mentorama”, the first Russian EdTech project launched in 2020 in Brazil), “Uchi.ru”, “Algorithmika”, “Yandex.Praktikum and “YaClass,” “iSpring,” “Internet Lesson” (launched in Kazakhstan), “TutorOnline” (launched in Turkey and Brazil), and other Russian EdTech companies [76].

In terms countries and revenue among Russian EdTech projects, the leadership was seized by children’s online schools for foreign languages, mathematics, and programming, including:

- “NovaKid”, an online English language learning school, a developer of educational apps, online courses in math, foreign languages, and science and art;
- cartoons for preschoolers and their parents “IntellectoKids”;
- “Kodland”, an international online digital skills school for children and teens;
- an international programming school for children “CODDY”;
- children’s gadgets in the form of teddy bears “Mishka AI” (Smart Bear);
- “Algorithmika”, an international mathematics and programming school.

Major EdTech market operators (see **Figure 3**) [77] in Russia working in the business-to-consumer field can be conditionally divided into three clusters with sub-groups:

- For the youngest: smart interactive toys, pre-school training.
- For schoolchildren: distance learning, Internet services, platforms for preparing for the Russian State Examination, collaboration with tutors, doing homework online, programming courses, and advanced education services.
- Adults have EdTech platforms such as multidisciplinary online universities, training programs and online simulators, languages, humanities, wellness, and lifestyles.

Slightly less than half (40%) of EdTech companies in Russia are engaged in b2b, including vendors in the IT-sphere, platform developers, and specialists’ services for academic and business institutions:

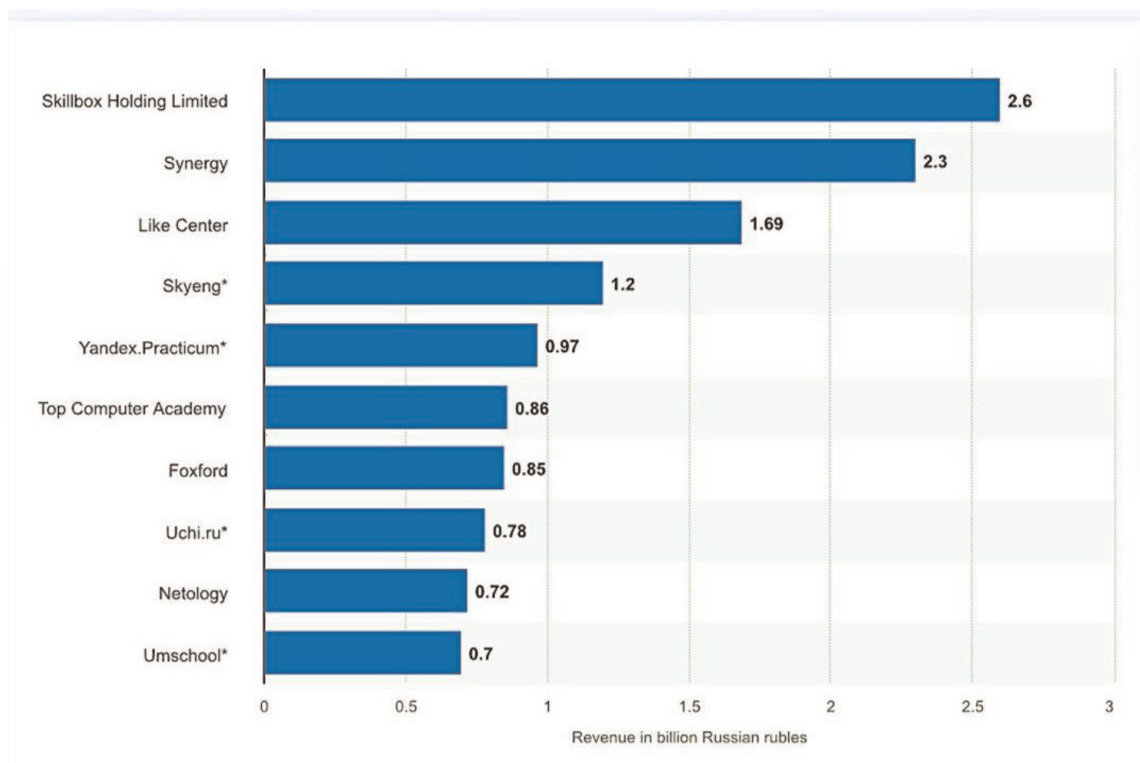


Figure 3. Leading EdTech platforms in Russia in 3rd quarter 2022, by revenue (in billion Russian rubles) [77].

- VR/AR-technology vendors in the education field;
- constructors of examination monitoring and observation systems;
- platforms for corporate training;
- solutions for launching online schools and training courses;
- the developers of equipment for education, and others.

As it can be seen, Russian EdTech is developing in the global trend.

EdTech, both in Russia and abroad, involves an ongoing analysis of the educational process in order to incorporate in its commercial proposal to bring trainees to a specified result.

The following techniques are extensively practiced while designing EdTech programs [78]:

1. *Game-based technique.* Which facilitates better learning by both children and advanced professionals due to considerable concentration of attention. At the moment it is used in practically all EdTech projects.
2. *Virtual Reality and Augmented Reality.* Possesses a high degree of visualization. VR and AR provide great potential in process visualization. For instance, while demonstrating chemical reactions in class, flasks and retorts are completely

virtual. No danger of inhaling poisonous fumes in case of mistakes – everything is demonstrated in VR with a thorough interpretation of what is happening. The Russian Railways also actively uses virtual reality technology: Training sessions for drivers and other categories of employees are held in the training centers.

3. *Artificial Intelligence.* That technology helps to make learning individualized. The curriculum is selected based on the analysis of the student's abilities. For example, when training novices' learners in business, the emphasis is initially placed on the formation of a core knowledge; but for those who have a specific experience, the curriculum is tailored-made to enable them, for example, to acquire the financial accounting nuances, the databases details, or the sales cycles construction.
4. *E-learning* is not even exactly a revolutionary trend, but rather a highly relevant method of providing training. One should not confuse it with distance learning, although there are certainly similar features. The E-learning takes place with extensive use of IT technologies and devices (virtual reality simulators, platforms for EdTech conferences, and software for smartphones). At the same time, teachers and students can be close to each other. E-learning radically changes the usual educational process itself. Actually, any course or workshop can be studied based on one's own preferences of place and time. It is possible to get a bachelor's degree online now as well since such programs are accredited, a "virtual" diploma is just as much accepted as a traditional face-to-face one.
5. *Microlearning.* The information environment of the contemporary world is extremely saturated. We are constantly exposed to streams of the very diverse information, and constant switchover from one to another discourages us from concentrating on anything specific for a long period of time. Classically educated adults are somehow able to absorb lengthy lectures, but young children raised in a culture of hyperattention begin to get bored and distracted after only six minutes. Splitting a considerable amount of material into several separate parts and presenting these modules as microlectures is a way to overcome the problem and is another type of educational countertrend in 2023. Microlecture is an information-rich lecture, usually lasting three to ten minutes. It discloses the concept of the area in question, provides terminology, etc. Table formats and infographics are used; to consolidate the material learned, there is often a test or practical assignment at the end. Providing the material in the form of distinct blocks encourages students to analyze information and to look for connections and correlations.
6. *Mobile learning.* However, including the already becoming mainstream online education is not really in demand among the young generations who cannot imagine their lives without a smartphone. They are interested in velocity, focus, and interactivity. It is not convenient to listen to an online lecture or other educational course from your phone, and the power may not be enough until the end of the event. A number of EdTech options offer an optimal solution to this problem. Many companies develop and actively implement educational programs for smartphones. Generally, the format of educational content in such applications is similar to the popular teen platform TikTok.

7. *Subscription-based training.* Before the massive pandemic lockdown caused by the COVID-19 pandemic, online courses were very popular. Individuals were actively using the products provided in the education market, absorbing the material, and receiving feedback and certification. However, such system has the significant drawback. Frequently, the purchasing courses online looked like buying “a pig in a poke”. On hearing the first lecture, the consumer suddenly becomes aware that the subject is of no interest to him, and the material itself is boring. Generally, in this case the money paid will not be returned, and the training efficiency without desire will be about zero. EdTech corrects the situation by introducing a subscription-based learning method. In this way, the users have access to the platform’s educational database. They can independently choose the courses they need at a given moment, combine, and change the course sets. Alternatively, they can stop learning altogether, without spending extra money on lessons they no longer need.

By analyzing current countertrends in EdTech companies, industry experts predict exponential growth in EdTech, at least for the next five years. History itself dictates the pace of global changes in the education industry which includes pandemic and other challenges. By the mid-twenty-first century, the demographic situation is believed to be one in which the number of graduates (both schools and universities) will be increased from the present number by two billion [75]. It is already forcing a radical re-evaluation of the methodologies, facilities, and entrepreneurial models of the education system. It will be necessary to solve complex problems under conditions of staff shortage and inadequate funding.

7.6.2 Business diversification by means of the international education market

Under the current conditions, business extension by entering the international education market seems more justified to business owners than development within the Russian market, including the possibility of attracting financing from international investment funds for a non-Russian venture jurisdiction.

7.7 “NovaKid”

As the most successful example at the moment, it is worth mentioning the international online school of learning English “NovaKid” [79] from the top 15 participants of the Russian market of online education with revenues estimated by Smart Ranking at 1.5 billion rubles for 2021. Founded in 2017 in Russia, “NovaKid” online English language school expanded into Turkey and Poland in 2018, in late fiscal 2018 – the legal entity was registered in Delaware, United States, and in 2019, the school began operating in Western European markets: Italy, Spain, and Germany. In 2020, NovaKid expanded into the North Maghreb and Middle East markets. According to public sources [79], the company’s revenue from “NovaKid” was about \$500,000 in 2018, \$2 million in 2019 and \$9 million in 2020, with the European market being the source of about 80% of the school’s revenue, the Asian market about 6%, and the rest of the revenue coming from the Middle East. The company’s estimated value in 2021 was in the \$150 million range. Over a four-year period, with an estimated 2021 value, “NovaKid” attracted about \$40 million in investment, mostly from foreign investors, including: BonAngels, Leta Capital, PortfoLion, LearnStart, TMT Investments, Owl

Ventures, and Goodwater Capital. However, “NovaKid” was originally created as an international company [80].

7.8 “EBAC online”

It is worth mentioning Russian businessmen’s Brazilian educational project, the online school of digital professions “*EBAC Online*” [81] which opened in 2020 and already generated monthly revenues of \$1.3 million in November 2021. Through 2021, the company has generated \$12.5 million in investments. Throughout 2021, the company attracted \$12.5 million in investments from the following investors, including foreign ones: Baring Capital, Begin Capital, AngelsDeck, and Sergey Solonin. The approximate value of the company in 2021 was in the range of \$82 million. “EBAC Online” opened an office in Mexico in 2021 and was targeted to expand into Colombia, Chile, Argentina, and Peru in 2022. According to an analytical company “HolonIQ,” “EBAC Online” was one of the top 100 promising Latin American EdTech start-ups in 2021 and is one of the EdTech leaders in the Latin American market [82]. Moreover, investment in the region has quadrupled from 2019 to 2021, from \$73 million to \$299 million, according to “HolonIQ.”

7.9 “MEL science”

The Russian–British educational company “*MEL Science*” (learning chemistry and physics through practical experiments using AR/VR technologies), launched in 2015 and currently operating in more than 40 countries, but focused more on the US market, has attracted about \$14 million in extra investment in 2020. Among the company’s investors: Yandex, Sistema VC (Sistema), Mubadala Investment Company, TMT Investments, Channel 4 Ventures, and Russian–Chinese Venture Fund (“RCIF”) [83].

7.10 “Algorithmika”

The company was founded in 2016, after two years worked in seven countries, and at the end of 2021 is already present in 37 countries and plans to enter the markets of Latin America and South-East Asia. The company develops by the franchise network under the same name. “Algorithmika” revenues were about 80 million rubles in 2017 and 155 million rubles in 2019. In 2019, the company was acquired by Mail.ru Group (VC), and in 2021, Algorithmika raised \$10 million in investments from two investment funds. In 2021, “Algorithmika” attracted \$10 million in investments from two investment funds: the Russian–Chinese Technology Investment Fund (RCTIF) and Winter Capital Partners Investment Fund. Over two years, from 2020 to 2021, the company’s revenue more than doubled, amounting to about 434 million rubles at the end of 2021.

7.11 “IntellectoKids”

The company “IntellectoKids”, the first mobile app for children, was launched in 2017 by Russian developers, and at the end of 2021, according to representatives of the company from open sources, the company’s applications are in the top ten Apple App Store (category Kids 5 & Under) in 40 countries and translated into more than 30 foreign languages. The main activity is concentrated in Europe and the United States,

and there is a slight expansion into the Chinese market. In 2020, “IntellectoKids” was raised as an investment in the first round of about \$ 3 million. It has raised about \$3 million from a number of investors, including: Allrise Capital, Genesis Investments, VERSHINA Capital, and QUONOTA Investments. Genesis Investments, meanwhile, has already invested \$1 million in the company. Genesis Investments invested \$1 million earlier in 2019.

7.12 “Kodland”

“Kodland” (which, according to public sources, is an alumnus of start-up Netology Group) was launched in 2018, raised \$1.5 million as an investment. It raised \$1.5 million in 2020. In 2021, “Kodland” expanded into the markets of Malaysia, Indonesia, Argentina, Spain, and India.

7.13 “CODDY”

The Russian programming school for children “CODDY” was launched in 2016. By the year 2020, “CODDY” launched a representative office in New York, and the company plans to expand into the markets of Spain and Italy. Franchise partners of the same name work in Russia, Ukraine, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Armenia, Azerbaijan, Georgia, Israel, United States, Germany, Latvia, Estonia, and Uzbekistan.

7.14 “Mishka AI”

“Smart Bear” (i.e., Mishka AI) was launched in 2018, the first external investors were the accelerator company “Starta”, the investment fund “Tiltech”, and a number of individuals. The start-up won the accelerator “Sber500” in 2019 and subsequently participated in the “500 Startups” program in the United States. In the period from 2020 and 2021, “Mishka AI” launched the localized version sales of the product in the US market under the brand name “Smart Teddy”. At the end of 2021, with revenues of \$1.3 million, the company had an estimated value of \$1.3 million. The company’s estimated value was about \$15 million.

7.15 “Lectera”

The international educational online platform “Lectera” started operating in 2020 simultaneously in several countries, having launched branches in Russia, the UAE and the United States. The platform’s educational programs are based on its own specially developed Fast Education methodology and use the “Money Education” principle (i.e., learn to earn). During the year of launch, according to “HolonIQ” and “EdCrunch”, “Lectera” became one of the 100 best EdTech start-ups in Russia and the CIS. In 2021, Lectera was awarded the prestigious international EdTech Breakthrough Awards as the best platform for continuous learning. Initial investments in the project from the pool of private investors from Europe amounted to about USD 2.1 million, and by the end of 2021, “Lectera” is one of the few independent EdTech companies, 100% share of which is owned by one owner. During the period from 2020 to 2021, “Lectera” attracted about 200 thousand users from fifty countries and, according to the company’s representatives from open sources, reached the revenue of over 5 million US dollars in 2021.

7.16 “Educate online”

The Russian online platform “Educate Online”, launched in 2018, helps everyone from 4 to 19 years old to learn foreign languages, subjects of interest or get a complete high school education abroad in the United States, Canada, Britain, and Switzerland, in a remote format, and obtain two diplomas of complete secondary education: Russian and foreign. “Educate Online” also implements training and admission programs for higher education institutions abroad, career planning programs, and overseas internships.

In 2020, Educate Online raised \$650,000 in investments from “Angelsdeck” members, with the support of “Altergate.vc”, the Singapore-based investment fund that syndicated the deal. In 2021, “Educate Online” raised an additional \$4 million in investments. “Educate Online” raised an additional \$4 million from a number of investors, including: “Xploration Capital”, “TMT Investments”, “Flyer One Ventures”, “Softline”, and “Angelsdeck”. The funds raised, in addition to the further technological project development, should be used to expand market into Latin America, Asia, and the Middle East, as well as to create an international students’ community. According to “Crunchbase”, “Educate Online” cumulatively attracted investments in the range of \$5.4 million from 2018 to 2021. In the Russian online education market, “Educate Online” will further compete with the “StudyFree” platform as it develops the track of admission to foreign universities.

7.17 “StudyFree”

The platform for grants and scholarships abroad “StudyFree” was launched in 2018, during the year with the help of the accelerator program of the “Internet Initiatives Development Fund” (IIDF) reaching an average monthly revenue of 2 million rubles. According to open sources, StudyFree reached self-sufficiency in four months of its existence in 2018. Subsequently, it participated in the accelerator company “Fiztech.Start” and won the international competition “Seedstars”. In 2020, the “StudyFree” platform became the participant in the American accelerator company “TechStars NYC” (New York) and “Berkeley SkyDeck” (San Francisco) and attracted \$2.9 million in investments from international venture capital funds, including “Acrobator”, “TMT Investments”, and “I2BF Global Ventures” at the end of 2021. In addition to the Russian market, the company also operates in the markets of Africa, Brazil, the United States, and India. One of the strategic partners is the student loan company “Prodigy Finance”. The main competitor of “StudyFree” is the Canadian company “ApplyBoard”.

7.18 “Buddy.ai”

The virtual English tutor “Buddy.ai,” in which a cartoon robot “Buddy” helps the user learn words and practice pronunciation, was launched in the United States by Russian developers in 2018. In 2020, the start-up “MyBuddy.ai.” won the international competition “Global EdTech Startups Awards. The app “Buddy.ai“ is an international project with its own know-how in voice technology and artificial intelligence, which works worldwide without any restrictions, helping children and adults to practice spoken English. Learning in the app is based on the use of game-based learning and spaced repetition methodology. In 2020, “MyBuddy.ai“ merged with another start-up with Russian roots, “Edwin“, which developed adaptive learning

technology and created educational courses in English for foreigners using Facebook chatbots and a tutor. The new company kept the name “MyBuddy.ai.” and attracted \$1 million in investment in the same year, 2020. The company, “MyBuddy”, raised \$1 million from the Russian venture capital fund “Leta Capital”. “Edwin”, founded in 2016, had also already attracted investments of up to \$1.5 million during its period of operation prior to the merger. The company has also attracted investments of up to \$1.5 million from a number of investors, including: “General Catalyst”, “Y Combinator”, “Google Assistant Investments Program”, and others [84].

7.19 “GetCourse”

The market of Brazil has attracted the greatest interest from Russian EdTech companies in 2021. In addition to the above-mentioned companies already operating in the Brazilian market, the “SaaS” platform “GetCourse”, according to open sources, is considering Brazil as the priority for market expansion, similar to the Russian market in terms of the amount of the average check and similar volume of the economy. In 2021, “GetCourse” plans to invest at least 25 percent of the \$50 million raised as an investment in international development [83]. The significant investments in “GetCourse” draw attention to another track in the online education market, in addition to increased competition and the Internet promotion cost, market consolidation, and the expanding Russian companies into foreign markets: the share growth of the “creator economy” market segment. The revenue of online courses by independent authors and online schools on the “GetCourse” platform showed a two-fold growth in 2021, and in the next few years the number of producers and the number of consumers of online courses may increase tenfold. According to “GetCourse”, in 2015 every third platform user bought a new educational product from the same online school repeatedly, in 2016 already 40% users made the repeated purchases, and in 2020 the share of such users grew to 50%. In 2021, shares in “GetCourse” were acquired by investment funds: “Winter Capital”, “Goldman Sachs”, and “Baring Vostok”.

8. Conclusions

In this paper, indirect data were used to define the potential demand for online courses of Russian universities by international market. In order to obtain objective indicators, it is necessary to conduct additional research on the MOOC market demand, which would analyze data from platforms on the specified topics, as well as the surveys of potential online courses consumers.

These examples of the successful launch and development of Russian EdTech startups, including those in international markets, show the powerful potential of the Russian entrepreneurs and developers, including the intellectual potential as well. Moreover, in Russia there are successful examples of creation and development of large local players and multistructure companies that won in the local market in competition with global international players, although not without the instruments of support from national legislation and state protectionism: VKontakte, which locally beat Facebook and Yandex, locally dominating the Russian search traffic market, in relation to Google, for a long period of time.

The global EdTech market of online education, for the most part, is dominated by global players, including Coursera, Udemy, EdX, and LinkedIn. Large local foreign

players, similar to such companies on the Russian market as “SkyEng”, “SkillBox”, or “Like Center”, are virtually absent from the international market.

A number of Indian, Chinese, and American companies may be considered as an exception, which, according to “HolonIQ”, are among the largest global EdTech companies “Unicorns” [84], but Chinese, American, and Indian companies are growing mainly due to the rapid growth of the local market, which, in no small part, is focused on the US labor market. At the same time, the US and Chinese online education markets occupy leading positions in the total volume of the global market, respectively, while the Chinese market, being extremely complex and highly competitive for external participants, supports its own national projects as a priority, including at the expense of strict state regulation. Thus, the conditions of the global technology market create prerequisites and opportunities for the successful international development of Russian technological projects, including in the online education market.

Even taking into account the current situation in international relations, access to the international market is possible, and the world has not changed completely, the world is, the world is spinning and life goes on.

1. there are post-Soviet countries, the BRICS countries, and Asia as a whole, which was discussed in the article with numerous examples of the entrepreneurial and developer success of educational and development projects. I am even sure that while we are reading this article, at least a dozen more projects by our fellow citizens are entering the international market. Well done, keep it up!
2. there are many projects that have already emerged, which continue to emerge and are already working well, even in countries whose leadership pursues an anti-Russian policy. The international project under foreign jurisdiction – “money past the cash register” somewhere, as it would seem, but this is life – business works where the opportunities are created for it.
3. with any course of events, except a global world catastrophe, there are those who lose, and those who find – someone leaves the business in a state of crisis, someone, on the contrary, uses this situation to develop business, himself, the country, and the world community. The worst thing in life is to give up and admit defeat. You are struggling, too: you read, you responded, you wrote a comment, you criticized, you did not show indifference – that is fine, that is life.
4. every event affects our lives, and I will say more, I believe that every single act and action we take affects our lives.

Everything changes and everything passes – it is not worth getting used to anything.

9. Recommendations

It has become clear in the XXI century for MOOC education to enter the mainstream and become a growing market as it continues to expand access to learning for more people [85]. Consequently, online educators and students are required to summarize subject information in order to critically weigh up significantly different perspectives and incorporate different demands. However, they need to create such opportunities by providing critical learning spaces where students are encouraged to

increase their capacity for analysis, imagination, critical synthesis, creative expression, self-awareness, and intensiveness in action. Only well designed and effectively delivered MOOC courses can survive to realize the possibility of blending classroom boundaries and connecting formal learning with wider spaces and broader social concerns through a vibrant MOOC learning community. Ultimately, education is about encouraging different ideas, different perspectives, and a cacophony of voices.

Web-based instructors are widely seen as facilitators [86], who are supposed to facilitate the merging of different theories and vibrant impressions. Instructors should encourage students to associate their discussions, assignments, and group work with their own experiences, the perspectives of others, their subjects, and their own learning and work. The current MOOC education is largely a one-size-fits-all standardized curriculum model that ignores students' needs [87, 88], and more attention should be paid to exploring how online offerings can meet the needs of individual students and provide differentiated online instruction through course design.

Furthermore, there is a need to know more about students' online experiences and what motivates students to participate in online learning. After all, online education is about students – their learning, academic performance, and much more. Better knowledge about the online process and the people involved will enable online educators and institutions to better design their courses, meet students' needs, and position themselves in a competitive global marketplace. Ke (2010) in his study pointed out that *a group of friends can dominate online discussions, thus intimidating newcomers*. From now on, facilitators should make a greater effort to appreciate the differences that exist in the online classroom, regardless of race, gender, class, ethnicity, sexual orientation, learning ability, experience, and socio-economic status. The focus should be on finding ways to strive for diversity to bridge differences, eliminate divisions, and promote these goals in the online environment. Instructors should try to create, facilitate, and promote an environment in which all students can learn from each other.

Eventually, instructors of MOOC courses deserve more research attention in order to explore their learning paths and professional development needs. It was reported that a large number of higher education teachers were reluctant to teach online courses, and those who did teach online courses reported that online lessons took much longer than face-to-face mode. Conversely, a common misconception is that online learning is easier than traditional classroom instruction. Considering the fact that MOOC is a new dynamic for beginners and experienced teachers alike, appropriate professional development is needed, which may include effective course design, coaching, implementation, and evaluation.

This review was initiated with the intention of the authors to design and teach MOOC courses, based on knowledge and information from the existing literature, but the authors sought to contribute to the field by discussing best practices and effective evidence-based strategies in online education. It can be useful for individual programmes and educators who want to design online courses and individualize course instructions and personalize academic learning. The research may also be useful for institutions that want to institutionalize online education in an era of fast-growing technology and increasing austerity. Individual institutions have their own vision and mission, and this research may enable them to create innovations for teaching and learning.

IntechOpen

Author details

Aida R. Nurutdinova^{1*}, Dilyara Sh. Shakirova¹, Elvira K. Sabaeva²
and Nadezhda O. Samarkina³


1 The Department of Contrastive Linguistics, I.A. Baudouin de Courtenay Higher School of Russian Language and Intercultural Communication, Institute of Philology and Intercultural Communication, Kazan Federal University, Kazan, Russian Federation

2 Department of Humanities Education and Sociology, Faculty of Economic and Humanitarian Disciplines, Almet'yevsk State Oil Institute, Almet'yevsk, Russian Federation

3 The Department of Oriental Studies, African Studies and Islamic Studies, Higher School of International Relations and Oriental Studies Institute of International Relations, History and Oriental Studies, Kazan Federal University, Kazan, Russian Federation

*Address all correspondence to: airnurutdinova@kpfu.ru

IntechOpen

© 2023 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

- [1] Chernov AA. Formation of the Global Information Society: Problems and Prospects. Moscow: Publishing and Trading Corporation; 2003. p. 232
- [2] Alekseeva I. The emergence of information society ideology. *Information Society*. 1999;1:30-35
- [3] Moiseev N. The information society as a stage of modern history. *Svobodnaya mysl*. 1996;1:81-83
- [4] Krasnova GA. Open Education: Civilizational Approaches and Open Education: Civilizational Approaches and Prospects. Moscow: PFUR Publishing House; 2002. p. 252
- [5] MIT OpenCourseWare. Free Online Course Materials [Internet]. Available from: <https://ocw.mit.edu/> [Accessed: January 25, 2023]
- [6] Connectivism. Reflections on open courses [Internet] 2010. Available from: <http://www.connectivism.ca/?p=267> [Accessed: January 26, 2023]
- [7] Siemens G. Connectivism: A learning theory for the digital age [Internet]. Available from: <http://www.elearnspace.org/Articles/connectivism.htm> [Accessed: January 26, 2023]
- [8] Minenkov GY. University Transformation and the Educational Process. Minsk: YSU; 2004. p. 164
- [9] Attwell G. MOOCs are here to stay [Internet]. 2012. Available from: <http://www.pontydysgu.org/2012/02/moocs-are-here-to-stay/> [Accessed: January 26, 2023]
- [10] Pappano L. The Year of the MOOC [Internet] *The New York Times*. 2012. Available from: <http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=1&r=0> [Accessed: January 26, 2023]
- [11] Timkin SL. Coursera – Leader of the movement of mass open online courses (MOE) [Internet]. Omsk State University named after F.M. Dostoevsky. Available from: <http://omsu.ru/page.php?id=4132> [Accessed: January 20, 2023]
- [12] Garrison D, Anderson T, Archer W. Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education*. 1999;2:87-105. DOI: 10.1016/S1096-7516(00)00016-6
- [13] Cavanagh S. Content analysis: Concepts, methods and applications. *Nurse Researcher*. 1997;4:5-13. DOI: 10.7748/nr1997.04.4.3.5.c5869
- [14] Tretiakov VS, Larionova VA. Open online courses as a tool for modernization of educational activities in higher education. *Vysshee Obrazovaniye v Rossii*. 2016;7:51-60
- [15] Bazanova EM, Sokolova EE. Mass online courses in academic writing: Managing student learning motivation. *Higher Education in Russia*. 2017;2:99-109
- [16] Dubrovsky D. Russia: The virus of distance education. *Eurasianet*. Available from: <https://inosmi.ru/social/20200413/247248937.html>
- [17] Karnoy M, Kuzminov YI. Online learning: How it changes the structure of education and university economics. *Voprosy Obrazovanie*. 2015;3:8-43
- [18] Borscheva VV, Chekun OA. Modernization of practical course

- “foreign language” for bachelor students of non-language faculties by means of modern technologies. *Modern Language Education: Innovations*. 2013;**2015**:6-9
- [19] Semenova TV, VilkoVA KA, ShegloVA IA. The market of mass open online courses: Prospects for Russia. *Voprosy Obrazovanie*. 2018;**2**:173-197
- [20] Koller D. What we’re learning from online education [Internet]. TED-talks. 2012. Available from: www.ted.com/talks/daphne_koller_what_we_re_learning_from_online_education.html
- [21] Lawton W, Katsomitros A. Global: International Branch Campuses Expanding, Geopolitical Landscape Changing. In: Mihut G, Altbach PG, Wit, H.d., editors. *Understanding Higher Education Internationalization. Global Perspectives on Higher Education*. Rotterdam: SensePublishers; 2012. DOI: 10.1007/978-94-6351-161-2_8
- [22] Flynn JR. The “Flynn Effect” and Flynn’s paradox. *Intelligence*. 2013;**41** (6):851-857. DOI: 10.1016/j.intell.2013.06.014
- [23] Yuan Li, Stephen P. MOOCs and Open Education: Implications for Higher Education. 2013. DOI: 10.13140/2.1.5072.8320
- [24] Jacoby J. The disruptive potential of the massive open online course: A literature review. *Journal of Open, Flexible and Distance Learning*. 2014;**18**:73-85
- [25] Tim de Langen F, van den Bosch H. Massive open online courses: Disruptive innovations or disturbing inventions. *Open Learning*. 2013;**28**(3):216-226. Retrieved March 24, 2023 from: <https://www.learntechlib.org/p/154914/>
- [26] Reich J, Ruipérez-Valiente JA. The MOOC Pivot. *Science*. 2019;**363**(6423):130-131. DOI: 10.1126/science.aav7958. Available from: <http://science.sciencemag.org/content/363/6423/130>
- [27] Cooper S. MOOCs: Disrupting the university or business as usual. *Arena Journal*. 2013;**39**(40):182-202. Available from: <https://search.informit.org/doi/10.3316/ielapa.425039263385676>
- [28] Perna LW, Ruby A, Boruch RF, Wang N, Scull J, Ahmad S, et al. Moving through MOOCs: Understanding the progression of users in massive open online courses. *Educational Researcher*. 2014;**43**(9):421-432
- [29] DeBoer J, Ho AD, Stump GS, Breslow L. Changing “course” reconceptualizing educational variables for massive open online courses. *Educational Researcher*. 2014;**43**(2):74-84
- [30] Kizilcec R, Saltarelli A, Reich J, Cohen G. Closing global achievement gaps in MOOCs. *Science*. 2015;**355** (6322):251-252
- [31] Hansen JD, Reich J. Democratizing education? Examining access and usage patterns in massive open online courses. *Science*. 2015;**350**(6265):1245-1248
- [32] Cohen L, Manion L, Morrison K. The ethics of educational and social research. In: *Research methods in education*. Routledge; 2017. pp. 111-143
- [33] Margaryan A, Bianco M, Littlejohn A. Instructional quality of massive open online courses (MOOCs). *Computers & Education*. 2015;**80**:77-83
- [34] Korn M. Big MOOC coursera moves closer to academic acceptance. *Wall Street Journal*, February, 7. 2013
- [35] RIA Novosti. HSE will help other universities to organise distance learning

for students. 2020. Available from:
<https://ria.ru/20200315/1568627807.html>

[36] Semenova TV, Vilkova KA. Types of integration of massive open online courses in the educational process of universities // practice and analysis. *University Management*. 2017;21(6): 114-126

[37] Griffiths MA, Goodyear VA, Armour KM. Massive open online courses (MOOCs) for professional development: Meeting the needs and expectations of physical education teachers and youth sport coaches. *Physical Education and Sport Pedagogy*. 2022;27(3):276-290

[38] Udacity [Internet]. Available from: <http://www.udacity.com/> [Accessed: January 26, 2023]

[39] edX [Internet]. Available from: <https://www.edx.org> [Accessed: December 26, 2022]

[40] Young J. Coursera hits 1 million students, with Udacity close behind [Internet]. *Chronicle of Higher Education*. 2012. Available from: <http://chronicle.com/blogs/wiredcampus/coursera-hits-1-million-students-with-udacity-close-behind/38801> [Accessed: January 26, 2022]

[41] Coursera [Internet]. Available from: <https://www.coursera.org> [Accessed: December 20, 2022]

[42] Protalinski E. Coursera adds 29 new universities to bring total to 62, offers first courses in Chinese, Italian, and Spanish [Internet]. *The Next Web*. Available from: <http://thenextweb.com/insider/2013/02/21/coursera-adds-29-new-universities-to-bring-total-to-62-offers-first-courses-in-chinese-italian-and-spanish>

[43] Lomas N. Berlin-Based Iversity Relaunches As MOOCs Platform, Sets Its Sights On Becoming The Coursera Of Europe [Internet]. Available from: <http://techcrunch.com/2013/03/11/iversity-moocs-pivot>

[44] Parr C. Futurelearn's boss on breaking into Moocs [Internet]. *Times Higher Education*. 2013. Available from: <http://www.timeshighereducation.co.uk/news/futurelearns-boss-on-breaking-into-moocs/2002636.article>

[45] Vassiliou. Welcomes launch of first pan-European university MOOCs (massive open online courses) [Internet]. European Commission, Press release, Brussels/Heerlen (Netherlands). 2013. Available from: http://europa.eu/rapid/press-release_IP-13-349_en.htm

[46] Fadzil M, Latif L, Munira T. MOOCs in Malaysia: A Preliminary Case Study. In: *Proceedings of the E-ASEM Forum: Renewing the Life- long Learning Agenda for the Future*. Bali, Indonesia; 2015. pp. 1-17

[47] Shen J, Ye M, Wang Y, Zhao Y. Massive Open Online Course (MOOC) in China: Status Quo, Opportunities, and Challenges. In: *Proceedings of the 7th IEEE Global Engineering Education Conference (EDUCON)*. Abu Dhabi the United Arab Emirates; 2016, 2016. pp. 1106-1108

[48] Nurutdinova A et al. The integrating face-to-face learning, distance learning technologies and M-learning technologies: Effectiveness. In: Layer ME, Tsiatsos T, editors. *New Realities, Mobile Systems and Applications*. Cham: Springer; 2021. DOI: https://doi.org/10.1007/978-3-030-96296-8_43

[49] Nurutdinova A, Shakirova D, Ismagilova G. The integrating face-to-face learning, distance learning

technologies and M-learning technologies: Effectiveness. Lecture Notes in Networks and Systems. 2022; **411**:478-486

[50] Nurutdinova A et al. Digital didactics in professional education: Limitations, risks and prognosis. In: Auer ME, Tsiatsos T, editors. *New Realities, Mobile Systems and Applications*. Cham: Springer; 2021. DOI: https://doi.org/10.1007/978-3-030-96296-8_27

[51] Nurutdinova AR, Shakirova D, Ibrahim F. Distance education during the covid19 pandemic case study: Students' & educators' perception. *ALPHA Proceedings*;5:1315-1326. DOI: [10.3897/ap.5.e1315](https://doi.org/10.3897/ap.5.e1315)

[52] Krokmal LA, Simutina NL. Integration in Higher Education Institutions in the Global Educational System. *European Research Studies Journal*. 2018;**21**:586-600. DOI: [10.35808/ersj/1025](https://doi.org/10.35808/ersj/1025)

[53] Government of India, Ministry of Human Resource Development, Department of Higher Education. Guidelines for Developing Online Courses for SWAYAM. Available from: http://www.sakshat.ac.in/officeDocumentUpload/27-06-2017/Guidelines_SWAYAM.pdf

[54] Available from: <https://www.mooc-list.com/tags/korea>

[55] Available from: <https://www.mooc-list.com/tags/japan>

[56] al Atabi M. Entrepreneurship: The First MOOC in Malaysia. In: *Proceedings of the Sixth Conference of MIT's Learning International Networks Consortium (LINC)*. Cambridge, MA; 2013. pp. 1-5

[57] Ministry of Education Malaysia. *The Malaysia Education Blueprint 2015–2025, Higher Education*, 2015.

[58] Chuang I, Ho A. HarvardX and MITx: Four Years of Open Online Courses — Fall 2012–Summer 2016. 2016. Available from: https://papers.ssrn.com/sol3/paperscfm?abstract_id=2889436

[59] Hong Y. Engineering Education in China. In: *Proceedings of the 18th International Conference of Interactive Collaborative Learning*. Florence, Italy: Curran Associates; 2015

[60] Available from: <https://www.mooc-list.com/countries/norway>

[61] Kjeldstad B. et al. MOOCs for Norway: New Digital Learning Methods in Higher Education. Available from <https://oerknowledgecloud.org/content/moocs-norway-new-digital-learning-methods-higher-education>

[62] Available from: <https://online.edu.ru/public/platforms?faces-redirect=true>

[63] Available from: <https://delovoyimir.biz/mooc-platformy-v-rossii-rynok-trendy-problemy-i-investicii.html>

[64] The figures are based on educational platforms included in the state information system “Modern educational environment in the Russian Federation” (<https://online.edu.ru>). In total, 1,262 online courses published by 94 institutions on 59 platforms were considered

[65] Semenova T, Vilkova K, Sheglova I. The market of mass open online courses: Prospects for Russia. *VO*. 2018;**2018**(2): 173-197. Available at: <https://vo.hse.ru/article/view/15707>

[66] Nurutdinova A, Shakirova D, Fazlyeva Z, Dmitrieva E, Sheinina D, Galeeva G. Gamification method to improve speech skills and proficiency among students: Methodology for implementation. In: *2021 World*

Engineering Education Forum/Global Engineering Deans Council (WEEF/ GEDC). Madrid, Spain; 2021. pp. 461-467. DOI: 10.1109/WEEF/GEDC53299.2021.9657342

[67] Available from: https://bigasia.ru/en/content/news/science_and_education/russian-schools-are-increasing-the-volume-of-high-technologies-in-the-educational-process/ [Accessed: January 15, 2023]

[68] Hollands F. Why do institutions offer MOOCs? *Journal of Asynchronous Learning Network*. 2014;**18**(3):1-20

[69] Hollands F, Tirthali D. MOOCs: Expectations and Reality. Available from <https://files.eric.ed.gov/fulltext/ED547237.pdf>

[70] Agranovich M. Knowledge at a distance. *Rossiyskaya Gazeta*. Available from: <https://rg.ru/2020/03/16/gotovy-li-vuzy-k-perehodu-na-distancionnoe-obuchenie.html>

[71] Federal Law 'On Education in the Russian Federation'. M.: Prospect

[72] Klimentyev DD, Klimentyeva VV. Optimization of academic educational programmes of Russian universities through the use of mass open online courses. *Problems of Linguistics and Pedagogy*. 2015;**4**(14):22-27

[73] Makoveichuk KA. Prospects for the use of courses in the MOOC format in higher education in Russia. *International Research Journal*. 2015;**2015**, **63**:66

[74] Mozhayeva GV. E-learning in Higher Education: Modern tendencies of development. *Humanitarian Informatics*;7:12 -21

[75] Report of HSE Online Learning Directorate Massive Open Online Courses at HSE. 2014–2015

[76] Available from: <https://www.holoniq.com/notes/2020-russia-cis-ed-tech-100-now> [Accessed: January 20, 2023]

[77] Patru M, Balaji V. Making Sense of MOOCs: A Guide for Policy-Makers in Developing Countries. Available from: <http://unesdoc.unesco.org/images/0024/002451/245122E.pdf>

[78] Available from: <https://www.statista.com/statistics/1222902/revenue-of-ed-tech-platforms-in-russia/> [Accessed: January 20, 2023]

[79] Available from: <https://www.skolkovo.ru/expert-opinions/vr-tech-for-education-and-business/> [Accessed: January 20, 2023]

[80] Available from: <https://www.novakidschool.com> [Accessed: January 15, 2023]

[81] Available from: <https://gb.ru> [Accessed: January 20, 2023]

[82] Available from: <https://ebaonline.com.br> [Accessed: January 13, 2023]

[83] Available from: <https://mbradio.ru/publication/2781> [Accessed: January 20, 2023]

[84] Global EdTech Unicorns. HolonIQ. 2022. Available from: <https://www.holoniq.com/edtech-unicorns> [Accessed: January 20, 2023]

[85] Chekun OA. Integration of mass open online courses in teaching foreign language to students of non-language specialties of MPGU. *Pedagogy and Psychology of Education*. 2022;**1**:108-111

[86] Gallagher S, LaBrie J. Online learning 2.0: Strategies for a mature market. *Continuing Higher Education Review*. 2012;**76**:65-73

[87] Brindley J, Blaschke LM, Walti C. Creating effective collaborative learning groups in an online environment. *The International Review of Research in Open and Distributed Learning*. 2009;**10**:3. Available from <http://www.irrodl.org/index.php/irrodl/article/view/675/1313>

[88] Saba F. A systems approach to the future of distance education in colleges and universities: Research, development, and implementation. *Continuing Higher Education Review*. 2012;**76**:30-37

IntechOpen