

Formation of Modern Open Educational Space

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Abstract

Rapid technological progress demands changing the traditional model of modern open educational space, which will meet the challenges of the digital era of the university community transformation. Within the traditional model of open education, there is a significant gap between the real sector of the economy and the innovations market. Thus, the educational programs offered by the university, as well as the graduates entering the labor market are not competitive. One of the key disadvantages of the current model is the fact that education is now regarded as a space where the specialists are trained at the request of an abstract customer through Federal State Educational Standards (FSES). FSES 3++ standards will not be able to bridge the existing gap with the real requests for the current competencies of the university graduates because the competencies of the professional standards are often focused on very general and out-of-date requests of their developers. The general disadvantage of the traditional model is training specialists for the existing jobs. Thus, the added value of such education is very low and as a result, there is a low level of the graduate's employment and a need for their external "retraining" to achieve the requested competencies. The purpose of our research was to develop the Open University model in which the cooperation of all the participants of the educational process will focus on training a unique specialist whose education will be performed by a researcher – innovator. To achieve that it is necessary to change the whole educational paradigm and to train specialists not for the existing jobs (initial professional training) but for the newly appearing technologically advanced jobs which may not yet be numerous in the real sector of the economy. That demands changes in the modern university ecosystem when the teacher shifts from being a mere transmitter of explicit knowledge to being a researcher-innovator. It is not possible without reconstructing the supporting infrastructure of the open educational space.

Keywords 1

Unique specialist, researcher-innovator, open educational space, "Open University", STEM, STEAM, digital platform

1. Introduction

The digital reality made it possible to shift from the elite model of university education "University 3.0" to the socially-oriented model "University 4.0". Its main purpose is to implement the third mission of the university and to increase the innovative sensibility and business activity of the population.

According to the contemporary authors (L.M. Andruhina, A.A. Verbitskiy, K.Y. Komarov, A.S. Ogonovskaya, A.-M. Rodríguez-García, and others) [1,2,3,4,5], open education should be understood as broadly as possible since it is not only a new innovative environment and infrastructure but also a new targeting system. And the development of the innovative potential of the individual and all the subjects of education becomes the main target of this system. Unlike the traditional closed educational spaces where the whole history of university education from the times of Platonic Academy (386 B.C.)

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up to the beginning of the 20th century was based on the principle of interactive communication “Teacher-Student”, the open educational systems are not limited to two subjects of the interaction and intra-university infrastructure. Traditional closed educational space is focused on the formation of hard and soft skills.

2. Digital Platforms and Apps

Digital applications and platforms are filling the educational space, and the educational process itself means the creation of virtual reality and immersion into it, participation in the creation and foundation of new practices. According to V.S. Efimov and A.V. Lapteva, “...any participant of the educational process in University 4.0 “is a subject of the search, trial activity, of “the game with the limits”, of conceiving and implementing “the created worlds”... University 4.0 should become a place of mass production of scientists, engineers – the possessors of the scientific mentality, actors of the industrial revolutions” [6].

O. Scharmer and K. Kaufer suppose that education in the University 4.0 will be developed in global (allocated) classrooms, innovative hubs, and the new model of the university is designed to provide common competence in vertical development that means the ability to comprehend and to improve surrounding systems [6, 7].

Generation Z is the major consumer in the field of education is inherently digitally competent, and the educational space openness turns out to be its naturally determined transformation [8].

The open educational space increases the number of collaborating parties, enhances their cooperation, development of different communities of practice, network structures.

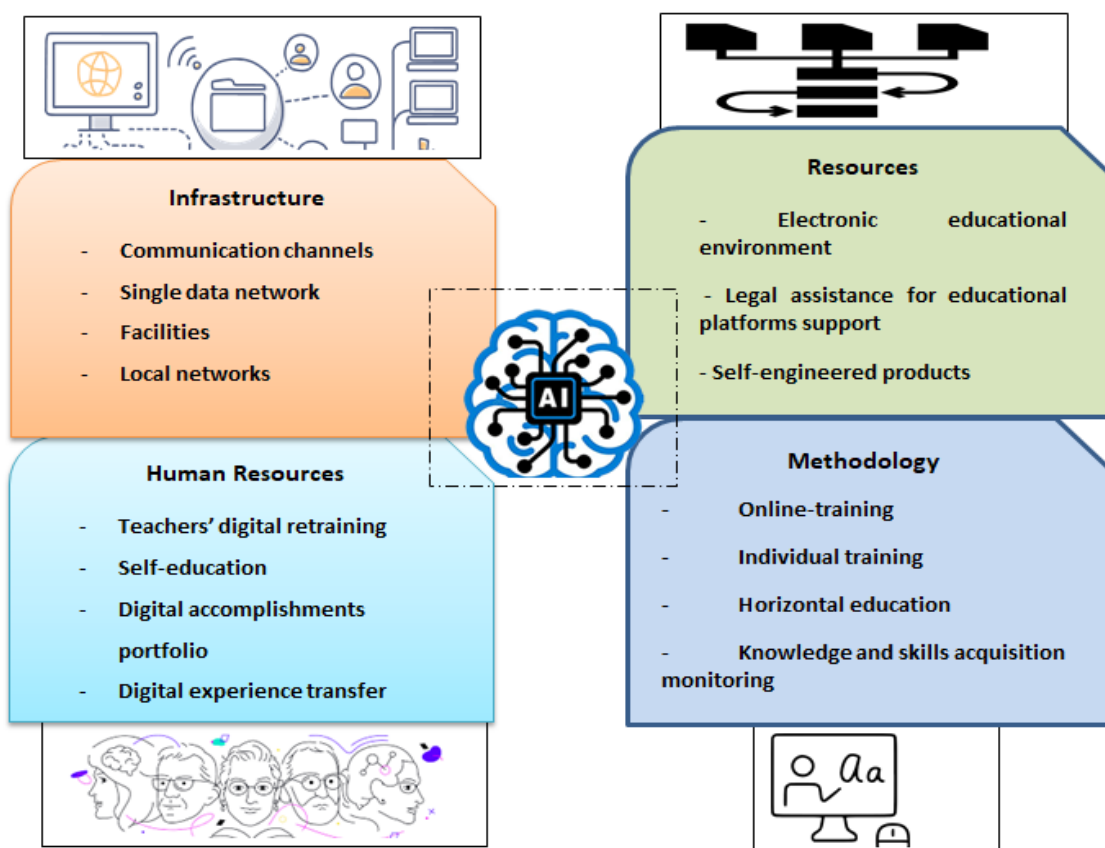


Figure 1: The basic scheme of a modern digital platform

Firstly, the open educational space should connect teachers, representatives of industrial partners, students, and society to achieve a particular innovative (production) objective or to tackle a problem for

collective work, an innovative product creation. The open educational space should be a hybrid consisting of digital apps and platforms and traditional material space of the university [9, 10].

3. The Open University Model

We propose the *Open University* model that displays a new paradigm of the open educational space within modern digital reality. The model implementation requires the industrial partners' more extensive involvement in the process of the model content creation and the innovative network structures support. In our opinion, a special emphasis should be made on pedagogical practices transformation, particularly on transition from dialogue-based communication to project-oriented one in cooperation with students and on the transformation of the role of a teacher who is to become a researcher-innovator. The *Open University* model is aimed not only at unique specialists' training (in contrast with specialists' basic training within the framework of the closed educational space) but also at making it possible for the University to secure its position as a territory of development of, at least, regional entrepreneurial and lean mindset.

Figure 2 shows the *Open University* model.

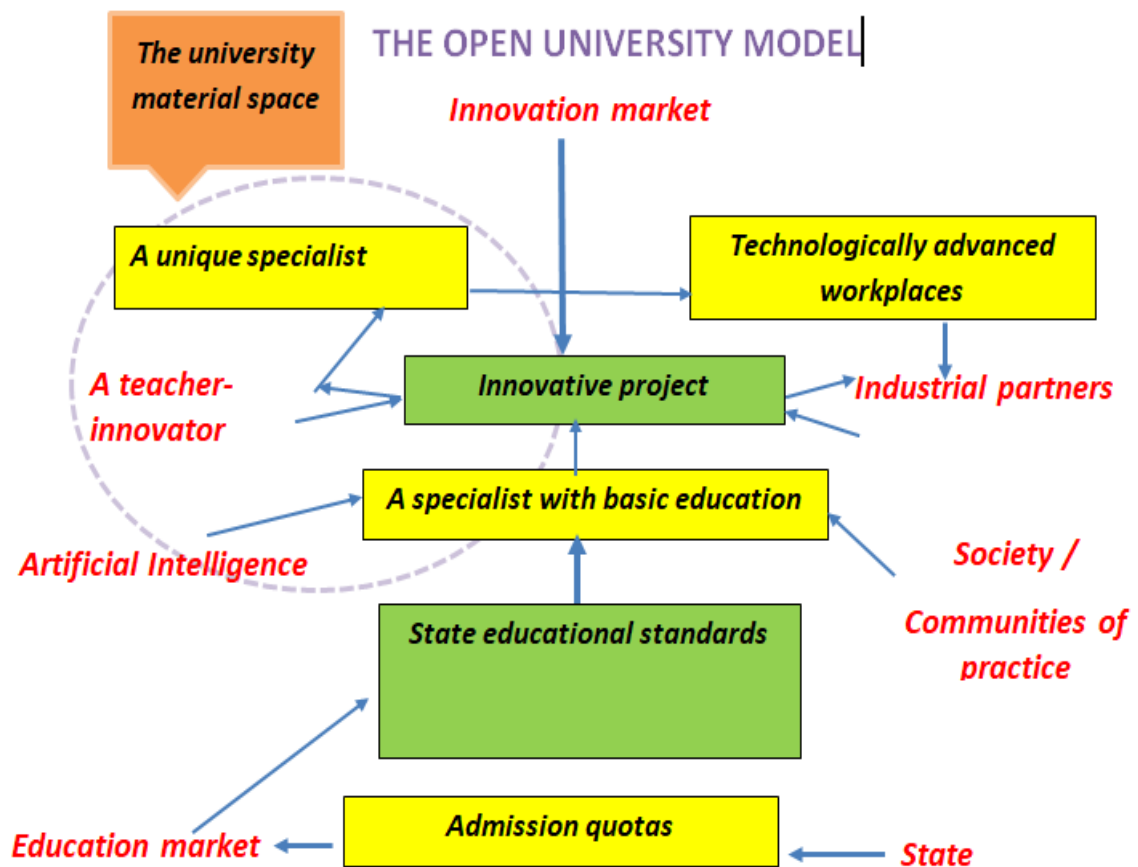


Figure 2: The Open University model

The proposed trends of higher education modernization (basic disciplines transformation) in the context of the digital educational environment will result in the transition of specialists' basic educational training mainly to Artificial Intelligence by 2030 [11, 12, 13].

We believe that within the next few years the emphasis of the Ministry of Science and Higher Education of the Russian Federation regulatory function should shift from submission of admission quotas (AQ) proportionally to population basis (to provide access to higher education) to direct correlation with future demands of real economy companies in technologically advanced workplaces

operators allocated through target contractual training. As for labor market development, it should be carried out through stimulating the creation of new technologically advanced workplaces.

The first two years of basic educational training form the basis of the specialists' worldview through the list of subjects, which are the most common for all the training programs. We consider that these subjects may include History, Philosophy, Mathematics, Economics, Law, Psychology, IT, Foreign language, etc.

Professionalization in the process of bachelor training begins with the third year of study through special subjects that form the professional worldview of the student. It makes the learning process hybrid.

Artificial intelligence begins to interact with all the subjects of the process in common educational activities within the digital platform.

The main tendency of the radical modernization of the entire educational process at the *Open University* should be the diffusion of university science into the innovation market to implement subsequently a project-based training for students. Within the future technology trends, the teacher (whose role is fundamentally changing from a transmitter of explicit knowledge into a researcher-innovator who forms and implements innovative projects) involves students in working on specific projects. This will become a real basis for the formation of individual educational trajectories for students as well as the basis for introducing new technologies in the industrial partners' activities.

In our opinion, such modernization of the educational process will increase the demand for educational and research services (including those with full compensation for training costs) in new, future-oriented professions and technologies, the trends of which are defined in the Atlas of New Professions and the Atlas of Future Technologies. These trends have shaped more with the convergence of the university and business community.

To our mind, after the bachelor's degree studying, the result will be the best if the traditional control of the assimilation of the educational program will be transformed into the presentation of new Startup or Spin-off companies. This will exclude the defense of the graduation thesis demonstrating the skills of working with explicit knowledge sources considering as obsolete, and will demonstrate the individual entrepreneurial potential of the most motivated students.

Students, who do not have the ability to innovative and entrepreneurial activity, should be provided with a confirmation of their level of preparation for Federal State Educational Standards through the most impersonal professional exam (possibly by analogy with the Unified State Exam at Russian schools). In any case, as the result, we obtain a Unique specialist who has gained not only general professional competencies but also knowledge of the production and technological processes of a particular industrial partner.

Master's degree programs cannot and should not be designed for a mass of students. They should become unique and assume even greater professional specialization of the student, who is fully focused on promoting the Start-up company and launching it in the market. A relatively small part of MA students will prepare themselves for the work in universities (including through further training in postgraduate studies).

To continuously improve the educational and research innovative processes in the *Open University* model, it is planned to create an independent system for evaluating the effectiveness and productivity of the individual trajectory of the student. The auditors will be industrial partners, whose educational program is aimed at solving technological problems, teachers-researchers (for the continuous implementation of the Kaizen principle for the internal educational and research innovative ecosystem within the university), other interested parties, and the student him/herself. The collection of statistical data on the effectiveness of individual educational programs, the validation of the results will become a reliable tool for managing the scientific and pedagogical design of the program. The frequency of such an audit should be undertaken at least once a year to make possible practical changes to the individual student training plan.

A special big challenge for the Open University should be the orientation towards a smooth transition to the graduation of not just a Unique specialist, but a specialist who has a basic understanding of STEM processes.

The abbreviation STEM was introduced in science by the staff of the National Science Foundation in 2001 to denote the educational paradigm. STEM training implies studying technology, mathematics, engineering, and natural sciences, along with the individualization of personal professional

development trajectory. According to research by European Schoolnet2, today 80% of countries identify STEM education as a priority of national education and national security, which, according to preliminary calculations, with the involvement of 1% of STEM specialists in the national economy gives the country's GDP growth by \$50 billion per year [14, 15]. Today the leaders of STEM education are the USA, Israel, China, and the United Kingdom.

Today STEM education is implemented through a triad:

- personalization of the student's educational trajectory;
- project thinking and teamwork;
- hybrid educational format.

In the first stage of implementing STEM educational processes, Open University can use the materials posted on open educational platforms Coursera, EdX, Udemy. Later, when it develops its cases, Open University can post them on its educational digital platform.

However, the combination of four academic and professional disciplines in natural, technological, engineering sciences, and mathematics aimed at training specialists with a new type of thinking (STEM) is considered to be flawed more and more often and futurists see the future in the combination of five disciplines - STEAM (+ art). It is possible within the framework of the Open University, where each training trajectory is a new educational, scientific and pedagogical masterpiece.

Russia has a unique document, the Atlas of new professions; among them, you can find a GMO farmer, creative state trainer, science artist, etc. State educational standards for these professions do not exist. Open University has the right to issue its non-state diploma in the professions of the future, as soon as individual educational programs are ready and approved by the auditor. In the 21st century, these educational programs are becoming more and more STEM-oriented.

While implementing such an educational paradigm in the “Open University” model, each educational institution becomes a place of forming a catalog of STEM cases, which later can be:

- unified and professional standard for training a STEM specialist of the future can be created;
- state standards of training specialists can be applied and their content can be quickly updated, preventing their obsolescence;
- professional skills can be expanded to lower levels of education (kindergarten, school, college);
- open educational space can be filled with modern content.

As a result, leaving the Open University, a graduate gets two diplomas – a traditional state one (in compliance with the requirements of state educational standards) and a non-state professional development document (obtained within the framework of the *Open University* model, developed by the STEM ideology).

4. Conclusions

The *Open University* model expands the opportunities to form a Unique specialist, for the number of incoming innovative requests to the industrial partners from the innovations market increases considerably. Kaizen principle is being launched in respect to educational and research innovative processes, real, but not “virtual” individualization of educational trajectories is taking place.

Alongside preserving the balance of professional education within the current state educational standards, STEAM model of specialists training will be introduced to increase their competitiveness in the labor market of the future.

Industrial partners entering the orbit of the *Open University* will be incited to technically refit their production facilities.

The state will be able to increase the added value of education owing to “producing” Unique specialists ready for work at technologically advanced jobs.

This may significantly slow down the rate of degradation of working population competencies, for the retraining programs, that universities will draw up for them, will be at most reconciled with the real needs of the labor market.

The development of educational standards by universities within STEAM model of education will enable Russia to create its catalog of cases on different areas of modernization of technologies and industrial markets.

According to the authors, the *Open University* model implementation will transform universities into the center of introducing innovations and territories development, a system of generation of new businesses, new markets.

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