University New Educational Reality in Disruptive Technologies Context

Nikolay A. Podymov 1, Mariam A. Nikoghosyan 2*, Alla N. Stolyarova 3, Svetlana V. Narutto 4,5, Nikolay A. Mashkin 6, Stanislav E. Martynenko 7, Zoya I. Paznikova 8, Petr K. Varenik 9

Department of Educational Psychology, Moscow State Pedagogical University, Moscow, Russia
2 Institute of Psychology and Education, Kazan (Volga region) Federal University, Kazan, Russia
3 Department of Management and Economics, State Social and Humanitarian University, Kolomna, Russia
4 Department of Constitutional and Municipal Law, Moscow State Law University named after O. E. Kutafin (MSAL), Moscow, Russia
5 Department of Legal Regulation of Economic Activity, Financial University under the Government of the Russian Federation, Moscow, Russia
6 Department of State and Legal Disciplines, Plekhanov Russian University of Economics, Moscow, Russia
7 Department of Theory and History of International Relations, Peoples’ Friendship University of Russia (RUDN University), Moscow, Russia
8 Department of Philological and Art Education, Banzarov Buryat State University, Ulan-Ude, Russia
9 Department of Legal Regulation of Economic Activity, Financial University under the Government of the Russian Federation, Moscow, Russia

Received: 22/07/2019  Accepted: 02/09/2019  Published: 03/09/2019

Abstract
The relevance of the study is due to a set of problems that have arisen in the educational environment of the University under the influence of technological breakthrough in the life activity of modern civilization. The fundamental reasons for the transformation of the higher education system in all its segments are mainly determined by economic and technological factors. Economic factors of disruptive technologies are carried out at the expense of significant acceleration of production and increase of profit, quality of goods and services. In the context of technological factors, models of transformation of traditional educational reality with the help of virtual reality tools are used. Together, these processes creatively destroy the traditional norms and rules, values and educational reality of the University. To substantiate the theoretical and practical significance of constructing a model of the new educational reality of the University, corresponding to the principles of disruptive technologies, pedagogical modeling is used as a leading research method. The article reveals the features of disruptive technologies’ development, important for the transformation of the educational reality of the University; the priorities of disruptive technologies’ implementation in the virtual educational reality of the University. The structure and content of disruptive technologies’ virtual model in the construction of a new educational reality of the University. The effectiveness of the structure and content of disruptive technologies’ virtual model in the construction of a new educational reality of the University is proved in the process of experimental work. The materials of the article have practical application and can be useful in the development and implementation of various techniques and practices in virtual services and in the educational process. They are recommended for teachers and students of the University.

Keywords: Virtual Reality, Construction of the Model, Context Of Disruptive Technologies, Transformation Model, Educational Reality of the University, Pedagogical Modeling, Principle of Mass Cooperation, Principle of Equal Interaction

1 Introduction
The study found that the interdependence of man, society, state and civilization as a whole are created through economic and electronic communication, when the destruction of previously stable functional and industrial relations at one end of the planet has a destructive effect on the same connection at the other end of the world (5). Thanks to disruptive technologies, innovations penetrate into all spheres of life activity and contribute to the introduction of more effective and flexible forms of updating the educational reality of the University (4). The principal for disruptive technologies in

Corresponding author: Mariam A. Nikoghosyan, Institute of Psychology and Education, Kazan (Volga region) Federal University, Kazan, Russia. E-mail: mar_nik98@bk.ru.
General is the effect of a significant acceleration of production and improvement of the quality of goods and services. In the context of understanding the prospects of innovative models of educational reality, they create additional market value of services provided by universities. The fundamental reasons for the transformation of the higher education system in all its segments are determined by economic and technological factors (1, 9). It is established that the economic factors of disruptive technologies are carried out at the expense of significant acceleration of production and improvement of goods and services’ quality. In the context of technological factors, models of creative transformation of traditional educational reality with the help of virtual reality tools are used. Together, these processes creatively destroy the traditional norms and rules, values and attitudes of the educational reality of the University (6, 7). At the same time, the economic efficiency of these destructions is determined; priority technologies are established among many other disruptive technologies. Today it is P2P business; software as a sum of services; web services and real-time computing; grid computing technologies; electronic tagging; electronic tagging system, etc. (2, 4, 5). The study proved the high level of demand for University teams in disruptive communication technologies, such as online cloud computing in the areas of interaction and communication, social networks and online information resources (8, 11). Based on the materials of this study, for the first time, as an independent scientific direction, an attempt is made to substantiate the theoretical and methodical approach to the construction of a model of a new educational reality of the University, based on the principles of mass cooperation, open educational resources and equal interaction of participants in disruptive technologies. To substantiate the theoretical and practical importance of constructing a model of a new educational reality of the University, corresponding to the principles of disruptive technologies, as a leading method of research, pedagogical modeling is used. The article reveals the features of the development of disruptive technologies, important for the transformation of the educational reality of the University; the priorities of disruptive technologies’ implementation in the virtual educational reality of the University are established. The structure and content of disruptive technologies’ virtual model in the construction of a new educational reality of the University are justified. The effectiveness of the structure and content of disruptive technologies’ virtual model in the construction of a new educational reality of the University is proved in the process of experimental work.

2 Literature Review

The special significance of the transformations of the University educational reality, mediated by the integration interaction of pedagogical and disruptive technologies, computer multimedia systems and interactive computer programs, network technologies and network models, is noted in a significant number of studies (3, 4, 5, 6, 7, 8, 10, 11). The efficiency of online cloud computing technologies in the field of interaction and communication of students, social networks and online information resources in the process of creating an innovative educational reality of the University is established (2, 4, 5, 9, 10). The importance of works on the design and implementation of a new paradigm of the educational process as a key idea of updating the educational reality of the University, using the method of T3 Framework is defined (5, 8). The studies of a group of authors (7, 9, 10), devoted to modifications of the educational reality of the University in the joint resource Computer Supported Intentional Learning Environment (CSILE) are of particular interest. This is a computer-supported learning environment or Knowledge Forum. It is proved that the Knowledge Forum resource is a prototype of the new educational reality of the University. It represents a virtual educational reality intended for students and teachers, allowing them to place educational materials, exchange ideas, data, analyze research results, discuss texts, design modern technologies, etc. In the course of the study, the active interest of specialists to the problem of disruptive technologies as a priority condition for updating the educational reality of the University is established. However, there are no sufficient grounds to speak about a holistic understanding of these processes for the transformation and construction of the educational reality of the University. Until now, there are methodologically incorrect approaches to the definitions and categories of disruptive technologies, to the substitution of technological meanings by economic categories of profit, goods and services, etc. Not all this contributes to the productive solution of the problem. Therefore, the study of disruptive technologies’ characteristics as the conditions of transformation of the educational reality of the University is seen as justified and appropriate.

3 Results and Discussion

3.1 Disruptive Technologies in the Process of Transformation of the University Educational Reality

The study found that the special attention of the pedagogical community and student communities to the prospects of transformation of the University educational reality due to the intensification of disruptive technologies, under which the educational reality of the University today appear communication technologies based on online cloud computing in the areas of interaction and communication, social networks and online information resources. Over the past decade, the paradigm of the Internet has changed significantly and the concept of online information resources as disruptive technologies is filled with new content. For example, the pedagogical technology of S. Magana - T3 Framework is actively used. This technology focuses teachers on the classification of students’ learning according to the level of complexity of the studied material: the usual translation of knowledge (translational level), the transformation of knowledge (transformational level) and the transcendence of knowledge (transcendent level). The separation and operationalization of levels takes place through specialized technological applications with a certain quality of information impact in order to achieve the desired result in the learning process (8, 11). Discursive content of disruptive technologies in relation to the transformation of the educational reality of the University in mass practice is manifested in the increased activity of users to the formation of information content of Internet services in the framework of the network communities. Confirmation of the established trend is a new level of Internet resources’ development that have changed the
types and forms of the student network interaction, as well as abolished the spatial and temporal boundaries between its subjects. Today, in the theory and practice of pedagogical science, the term digital disruptive technologies refers to an automated virtual platform on the Internet that unites students with the help of software and hardware and allows them to carry out individually or collectively a variety of educational activities based on the resources of the educational reality of the University. It is proved that the services of social networks and online information resources is an interactive multi-user website, the content of which is filled by the network participants themselves. It has a set of applications – software systems, including:

- Instant messaging (allow you to communicate with another user through the network in real time);
- Online chats (allow multiple users to communicate in real time at the same time);
- Online forums (users on this site can view the topic and leave their comments in sequential recording mode, as well as create a new topic available to other participants);
- Web blogs - personal online magazines of individual users, in which the owner can post messages in his/her journal, while other users (readers) can leave their comments to them;
- Wiki-reference - websites, the content of which can be edited by visitors (6, 7, 9, 10). It is established that network services are the technological (instrumental) basis for the construction of various structures and forms of educational reality of network institutions, network communities, network competitions and Olympiads and educational process models. It is proved that the emergence of a significant number of different network services stimulates the development of network educational activities and an increase in the number of network educational platforms that radically transform the educational reality of the University. Students who fairly assess their extensive information potential, which opens up global advantages for educational reality, actively use them: personalized learning, new models of cooperation, new learning strategies (4).

3.2 Priorities of Disruptive Technologies’ Implementation in the Virtual Educational Reality of the University

It is proved that the chip is a technical achievement of disruptive technologies. It has already been active in a wide range of areas, from answering machines to medical diagnosis. A chip is a tiny square of silicon that holds millions and millions of bits of information that can be captured at the speed of light. Today, up to 16 million numbers and letters can be transferred to one such scheme; by the end of the century, it will fit a billion of such signs. So-called supercomputers, based on a technique known as massive parallel processing, with the ability to perform more than a trillion mathematical operations per second, help scientists and engineers in areas such as testing the body's response to a new drug without involving living people for testing; mapping the genetic structure of a person to better understand the course of hereditary diseases; developing models of different climatic conditions on earth in order to study the changes caused by air pollution; application of spoken language and speech images to enhance the versatility of factory robots (2, 3, 5, 9, 11). Thanks to the computer, more and more objects of the future will acquire the ability to move, talk, and work. They will focus the life, mind, and values of those who create and then use them. They will be like a continuation of our senses, the functions of our body. Computers, for example, expand the scope of human brain activity and in the near future will probably present artificial intelligence. The new computerized textbooks, which will make available to any student the contents of the repositories of all the world's libraries, will be able to copy in an individual form the education that was once received in the usual, standard way in schools and universities (3). Such achievements in the development of science and technology, implemented with the help of disruptive technologies, radically transform the entire educational reality of the University. Today, countries with advanced technologies (USA, UK, Canada, and Singapore) developed disruptive technologies using hologram images of the lecturer in 3D format, conducting regular training sessions with students from remote studios in an interactive mode of virtual educational reality of the University. The virtual picture creates the effect of the presence of a live teacher in the classroom, allows students to discuss with him/her remotely (9, 10).

The research substantiates the priorities of disruptive technologies implementation in the virtual educational reality of the University:

1) the creation of information and communication reality, providing the organization of ways of access and use of information resources of network services: wiki, blog, website, social network, which have their own distinctive features, but in General have all the necessary capabilities to host and implement a network project;

2) The creative tasks’ design and activity products’ placement. Tasks can be both individual and collective, focused on the performance of tasks by each team - participant or allowing to involve all teams at the same time, or to organize interaction between teams. Since the tasks are of a network nature and the participants do not always have the opportunity to interact in reality, it is important to organize their interaction in the network in various ways of joint execution of tasks, when the teams see the results of each other's work;

3) Selection of tools for the organization of communication lines.

It is a procedural unit that functions in a particular format (chat, forum, blog, messaging), that has its own educational goals and objectives and provides a stable communication interaction between the participants throughout the implementation period. The leading types of communication lines are established:

- The news line is a mandatory component of the network project, directing the progress of its implementation through information support. Regularly created messages about events and deadlines form the route of promotion of participants on the project;

- Consulting line is the most important component of the network project, as it aims to support the independent activities of the participants;

- Thematic line – a prototype of the conversation, implemented in the format of a forum, blog or other means of network communication and related to the problem of the network project by the content;
The line of interaction between teams is a means of participants’ self-organization for joint activities;

– Reflexive line – line of understanding and evaluation of performance.

The design of communication lines in a network project largely depends on the state of the educational reality of the network and its instrumental capabilities. It is proved that the communication blog is the most convenient for the organization, as the technology of blog implies a dialogue (for each blog post you can leave a comment).

4) Design and implementation of tools to promote the results of activities on the Internet:
   – E-mail distribution;
   – Placement of information in the relevant network communities;
   – Placement of information on the official websites of educational organizations and educational authorities;
   – Placement of information on personal educational resources of teachers and students (1, 2, 4, 10).

3.3 The Structure and Content of Disruptive Technologies’ Virtual Model in the Construction of a New Educational Reality of the University

It is established that in the educational practice of the University disruptive technologies are placed on the server of a multi-user website that unites teachers and students with the help of software and technical services of social networks and cloud online resources that allow to carry out individually or collectively a variety of communicative and educational activities, which together make up the educational reality of the University. This is the highest priority service of social networks and cloud online resources for placement of disruptive technologies based on online cloud computing in the areas of interaction and communication, supplemented by pedagogical resources of the University (4, 11). In the network, the participants of the educational process are united by communication and interaction services. The levels of development of educational technologies’ models are set: diagnostic, formative, reflexive evaluation. Levels are allocated based on possible options of the student interaction in innovative virtual and educational reality of higher education institution:

– At the diagnostic level, the interactions are alienated, the participants of the interaction are not connected by something common, do not attach any value to joint discussions;

– At the forming level, each of the students becomes an active subject of the educational reality of the communicative process and involves other students in its implementation;

– At the reflexive – evaluative level, students evaluate themselves and other fellow students as subjects of educational reality, see the value in themselves and others.

Allocation of levels of students’ interaction creates prerequisites for the design and implementation of disruptive technologies’ content as an innovative model of educational reality:

– At the preparatory stage, the diagnostic level of the model is carried out: the purpose and problems of the educational process, the range of participants, the timing of implementation are determined, preliminary preparation is carried out. The leading role in the network project at this stage is given to the personality of the teacher as the organizer of the process, and the long-term goal is to create the necessary conditions for the implementation of educational activities in the network. All activities at this stage involve the study and testing of technology tools;

– At the stage of educational activities’ organization, the initial development of the process is carried out – a joint discussion of General ideas, the definition of specific research topics, the distribution of students into groups, the definition of General rules and terms of development of copyright materials, criteria for their evaluation, etc. The activity of students and teachers involves intensive discussion and development of common points of view on various issues, the definition of group goals and objectives, group norms and rules are developed, the primary ideas of each of the group members, their role and status in this process are formed. Students get the experience of entering the network society and the use of disruptive technologies’ tools of online communities for collaborative addressing educational challenges. The teacher determines student activity at this stage;

– At the stage of educational tasks’ development, the educational importance of network development is determined, as well as the possibility of its implementation by a large number of students who can coordinate their activities through the services of the website. From the existing variety of pedagogical definitions, characteristics and criteria, the pedagogical technology T3 Framework (8) is singled out as dominant. This technology focuses teachers on the classification of students' learning according to the level of complexity of the studied material: the usual translation of knowledge (translational level), the transformation of knowledge (transformational level) and the transcendence of knowledge (transcendent level). Allocation and operationalization of levels through specialized technological applications with a certain quality of information impact, allow determining the priority of disruptive technologies in the innovative transformation of the educational reality of the University (8, 11, 12).

4 Conclusion

The study confirms the theoretical and practical significance of disruptive technologies as an actual direction of innovative transformation of the University educational reality. Based on the results of the study, the significance of disruptive technologies resources as a technological (instrumental) platform for creating a new educational reality of the University is confirmed. In the course of the study, the tendency is established of growth of various network services stimulating the development of priority services of social networks and cloud online resources for the placement of disruptive technologies based on online cloud computing in the areas of interaction and communication, supplemented by pedagogical resources of the University. The priorities of disruptive technologies based on the ideas of a new paradigm of social network and a new educational reality of the University, together creating a single educational reality designed to solve universal problems of student training. The
results of the study confirm the assumption that disruptive technologies is an innovative model of the educational reality of the University, providing the transformation of technological (instrumental) conditions of the educational environment, in which the processes of communication exchange, individual and joint activities, mutual support of students in the implementation of educational tasks. On the basis of the materials of this study for the first time, as an independent scientific direction, the substantiation of the theoretical and methodical approach to the construction of a model of a new educational reality of the University, based on the principles of mass cooperation, open educational resources and equal interaction of participants of disruptive technologies. The article reveals the features of disruptive technologies development that are important for the transformation of the educational reality of the University; the priorities of disruptive technologies’ implementation in the virtual educational reality of the University are established. The structure and content of the virtual model disruptive technologies in the construction of a new educational reality of the University are justified. The effectiveness of the structure and content of disruptive technologies’ virtual model in the construction of a new educational reality of the University is proved in the process of experimental work.

References