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INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION OF RUSSIA AND CHINA

Ключевые слова*: информационно-коммуникационные технологии, ИКТ, педагогическая технология, традиционный тип обучения, инновационный тип обучения, интеграция.*

Цель статьи – выявить и обосновать инновационные педагогические поиски в области использования постоянно совершенствующихся информационно-коммуникационных технологий (ИКТ) в России и Китае. В исследовании проведен сравнительный анализ типов обучения с учетом использования информационных и коммуникационных технологий. Китайский опыт представляет большой интерес для российских педагогов в связи с богатой китайской философией, национальными традициями и педагогическими знаниями. Россия и Китай имеют глубокие исторические, интеграционные, экономические и культурные связи. В Китае система образования вывела страну на ведущую позицию в мире и на второе место в экономике. Автор выявляет сходства в системе образования России и Китая. Позитивные достижения в системах образования этих стран взаимно обогащают друг друга, приобретая глобальный характер. В то же время китайская система образования имеет ряд достижений, которые необходимо интегрировать в российскую систему образования. В исследовании сравниваются традиционные и инновационные типы обучения в России и Китае с точки зрения показателей: подход к обучению, доминирующая идея, цель, центрация на субъекте деятельности, роли педагога (преподавателя), роли обучающегося, ценности, на которые опирается педагог (преподаватель), достоинства, недостатки, основные результаты. Исследование выявляет основные характеристики типов обучения и позволяет установить, что на теоретическом уровне традиционные и инновационные типы обучения противоположны, а на практике они органично сочетаются, дополняют и усиливают друг друга. Опыт

Китая в использовании ИКТ в образовании неоценим при осуществлении модернизации образования в России.

***Keywords**: information and communications technologies, ICT, educational technology, traditional type of teaching, innovative type of teaching, integration.*

The purpose of the article is to identify and substantiate the innovative pedagogical searches in the field of the use of constantly developing information and communications technologies (ICT) in Russia and China. A comparative analysis of types of teaching was carried out taking into account the active use of information and communications technologies. Chinese experience is of great interest to Russian teachers due to the rich Chinese philosophy, national traditions and pedagogical knowledge. Russia and China have deep historical, integration, economic and cultural ties. The system of Chinese education brought the country to the leading position in the world and to the second place in the economy. The author reveals similarities in the education system of Russia and China. Positive achievements in the education systems of each of these countries are mutually enriching each other, acquiring a global character. At the same time, the Chinese education system has a number of achievements that have to be integrated into the Russian education system. The study compares the traditional and innovative types of teaching in Russia and China in terms of indicators: an approach to teaching, a dominant idea, a goal, centering on the subject of activity, teacher (instructor) roles, student roles, values on which a teacher (an instructor) relies, advantages, disadvantages, main results. The study identifies the essential characteristics of the types of teaching and makes it possible to establish that, at a theoretical level, the traditional and innovative types of teaching are opposed, but in practice they organically combine, complement and reinforce each other. China's experience in the use of ICTs in education is invaluable in the implementation of the modernization of education in Russia.

A distinctive feature of the development of education in the modern world is the active use of information and communications technologies (ICTs). The changes taking place in modern world pedagogy are connected with the processes of

modernization, introduction and use of innovations. One of the components of modernization of modern education is the formation of an innovative educational space. The development of information and communications technologies has led to the fact that a person can receive knowledge beyond the boundaries of traditional educational institutions. However, not all aspects of education connected with the use of ICTs are sufficiently developed. In the context of international educational integration, the modernization of the world's education systems is linked, among other things, with the active introduction and use of modern ICTs in the learning process.

The aim of the research is to identify and substantiate innovative pedagogical searches in the field of the use of constantly improving information and communications technologies in modern world education.

The world is entering the fourth industrial revolution. The basis of this revolution is information and communications technologies. The future of both countries and an individual, more than ever, will depend on the use of digital technologies. The possibilities of processing and storing information are growing, knowledge is becoming available to more people than ever before in the history of mankind. Information and communications technologies represent a higher potential for human development, as the influence of new technologies, such as 3-D Printing, quantum computing, energy storage, artificial intelligence and the Internet of Things [17].

The World Economic Forum in cooperation with INSEAD and Cornell University in the Global Information Technology series presented the results of measuring the driving forces of the ICT revolution around the world using the Network Readiness Index (NRI). The index evaluates the state of network availability using 53 separate indicators. For 139 countries, including Russia, China and the United States, it makes it possible to identify priority areas for the fuller use of ICT for socio-economic development. From the report of the World Economic Forum in 2016 it follows that «innovation is increasingly based on digital technologies…, which can drive economic and social gains from ICTs if channelled in a smart way… both the private sector and governments need to step up efforts to invest in innovative digital solutions to drive social impact» [17].

Innovations in the socio-economic sphere have an impact on innovation in the education system. Education, performing a public function, reflects changes in society. The level of development of education is an indicator of the socio-economic level of the country's development. Innovations in education are a consequence and a necessary condition for social development. Without highly qualified staff, characterized by innovative thinking, possessing unique skills and abilities, able to adapt to the rapidly changing operating conditions, it is difficult to achieve social and economic progress. Innovations in education are not only pedagogical problems, but also social problems. Innovations in education and social life should contribute to progress.

ICTs can contribute to the implementation of the global education agenda for the next 15 years. The effective use of ICT in education, professional development and support of teachers, increasing the scale of successful innovations in the field of education throughout life, the contribution of technologies to the creation and dissemination of knowledge (in particular through open educational resources), recognition of the means and results online training, monitoring and evaluation of successful practices are the main problems of modern education.

The effective use of ICTs has to help to solve the urgent issues in the field of education. It is very important for modern pedagogy to uncover the potential of use of ICTs in education. Qingdao Declaration highlights the various ways in which technologies can contribute to the realization of the global education agenda that was proposed at the World Educational Forum for the next 15 years. The Declaration states that the outstanding achievements in the field of information and communication technologies (ICTs) and the rapid spread of the Internet access have made the modern world more interconnected and provided knowledge of ICTs. Thus, Qingdao Declaration, the first global declaration on ICTs in Education, which states that ICTs should be used to achieve the goal of inclusive and equitable quality education and lifelong learning by 2030, ICTs should be used to strengthen the educational systems, disseminate knowledge, provide access to information, provide quality and effective teaching and provide more effective services [14].

China Ministry of Education (MOE) has released the National Plan for Medium and Long-term Education Reform and Development (2010–2020). This plan contains some strategies for education development and also proposes development goals for all levels of China education. «By 2020, higher education will be better structured, and it shall also go up a notch in talent or professional development, scientific research, and social service as a whole. A number of high-quality and world-known universities will come to the fore, some of which will be on the world-class list» [28, p. 181].

A theoretical inquiry was used in our research, i. e., a theoretical review of literature and conceptual study for proposing new ideas in the use of ICTs in modern education. An evaluation research is aimed at determining the impact of ICTs on education (innovation based on the application of the ICTs in education, modernization of education on the basis of modern ICTs, a humanistic approach to education). A developmental research is aimed at developing and evaluating an existing and newly developed system of education based on the ICTs.

The nature of innovative teaching is comprehended through its comparison with the traditional teaching. *Comparison of traditional and innovative types of teaching in education of Russia and China* is carried out according to the indicators, which we have identified on the basis of the analysis of scientific literature: (1) an approach to teaching, (2) a dominant idea, (3) a goal, (4) centering on the subject of activity, (5) teacher (instructor) roles, (6) student roles, (7) values on which a teacher (an instructor) relies, (8) advantages, (9) disadvantages, (10) and main results.

The presented Table 1 is compiled and systematized by us on the basis of the analysis of the ideas of the scientists of Russia, China and the USA, who study the use of ICTs in education in secondary schools and Universities [1–13; 15–23; 25; 28].

We have analyzed the traditional and innovative types of teaching on indicator (1) an approach to teaching, which is understood as a theory, which is the methodological basis of a certain type teaching. The basis of the traditional type of teaching is «the supportive teaching», which is the process and the result of learning activity aimed at the maintenance and reproduction of the socio-cultural experience. This type of

teaching is traditionally inherent in school and university education. It was called the administrative approach to teaching.

An innovative type of teaching is the process and the result of teaching and learning activities that stimulate the introduction of innovative changes in the existing culture and social environment. This type of teaching stimulates an active response to the problems that arise before an individual and society. The innovative teaching transforms teaching in relation to the goal, the peculiarities of interaction between the teacher (the instructor) and the students, their roles in the teaching-learning process [13, p. 4]. The approach to teaching, based on the use of information and communications technologies is aimed at formation of students' skills to independently navigate a large stream of knowledge, find the necessary information and knowledge, actively absorb them and effectively use them in practice.

The analysis of the types of teaching according to indicator (2) a dominant idea showed, that «Education for Life» is the dominant idea in the traditional type. A person, having received an education, passed the teaching in a timely manner. The formed knowledge and skills were practically relevant throughout his life.

«Progress in information technology exerts profound impact on every field in modern society including traditional education» [24, p. 96]. In the innovative type, a dominant idea in education is «Lifelong Learning». The total amount of knowledge in the world since 1950 has doubled every 10 years, since 1970-every 5 years, since 1991 – every year. In this regard, a person will have to acquire new knowledge, form skills and competencies throughout his life, as his life and professional activities change. An approach to teaching based on the use of information and communications technologies helps to reduce the innovation cycle, accelerate the pace of information and knowledge transfer, and implement the slogan of modern education: «Lifelong Learning».

«ICT in education as the breakthrough point and an important support for realizing education modernization is a strategic choice to improve educational quality, promote educational equality, and realize educational reform» [24, p. 96].

The analysis of the types of teaching according to indicator (3) a goal showed, that in the traditional type of teaching the goal is the formation of a certain system of knowledge, skills and personal qualities. The objectives of the lesson are strictly detailed and from them it clearly follows what kind of knowledge and skills the teacher (the instructor) should teach the students.

In the innovative type of teaching the goal is to develop the skills of critical and creative thinking, interpersonal interaction and the formation of value relationships in a group, and to teach students to learn and acquire knowledge independently.

The analysis of the types of teaching according to indicator (4) centering on the subject of activity made it possible to establish that one of the central problems of pedagogy is the problem of interaction. In traditional teaching interaction is seen as a process of knowledge transfer of by the teacher (the instructor) to the student (explanatory process). With the traditional approach to teaching students do not take part in setting goals. The teacher (the instructor) plays a central and active role in the teaching process, the feelings and value orientations of the students are not taken into account.

An active role (more precisely, unidirectional pedagogical influence) belongs to the teacher (the instructor) who controls the teaching process. Value orientations and feelings of students do not determine the nature of interaction. They are outside of the pedagogical leadership. The traditional type of teaching characterizes the teaching process as a process centered on the teacher (the instructor). The traditional type of teaching supposes the centering of the teaching process on a teacher. The teacher plays a main role.

The innovative type of teaching supposes the centering of the teaching process on the student. The conventional education approach has been changed from a teacher-centered approach to a student-centered approach [26, p. 39]. In the context of humanistic education, the personal aspects of interaction come out on top: the student's personality is placed at the center of the teaching process with his needs, interests and experiences. This determines the centering of the teaching process on the personality of a student. The teaching methods through which the teacher (the instructor) puts the student's personality in the center of the teaching process are centered on the learner.

These methods ensure the focus of the teacher's activity on the student. These methods are addressed to the student's personality, and the realization of the goal and tasks of the pedagogical activity contributes to his development. In teaching, centered on the students, students participate in setting goals; their feelings and value orientations (a humanistic approach) are taken into account; the teacher (the instructor) in the process of interaction with students is an assistant, a consultant [16, p. 359].

The result of the centering of the activity of the teacher (the instructor) on the student is interaction between them. The active role of the student, his self-control over actions, and responsibility for the results of the teaching are «leading» ones. The system of value orientations of students, their emotions and feelings acquire meaning for the teacher (the instructor) and they are significant in the light of the interaction of the student with the teacher (the instructor) and other students.

All this becomes the basis for the formation of the students' emotional-value relations with the world, people and themselves. The student plays a passive role. The teacher plays an active role, a «guiding» role in the teaching process. The centering of the teaching process on the student or on the teacher (instructor) supposes correspondingly special roles for the students and the teacher (the instructor).

The analysis of the types of teaching according to indicator (5) teacher (instructor) roles showed, that in the traditional type of teaching the teacher (the instructor) dominates, he plays a central and active role. The traditional type of teaching characterizes unidirectional pedagogical influence; emotional aspects in the interaction between the teacher and students are absent.

In the innovative type of teaching the teacher plays the role of facilitator, promotes the learning process and helps the students to find the ways to success. The teacher (the instructor) recedes from the directive role and gives the cognitive initiative to the students. Centering on the student assumes that the teacher (the instructor) can perform different roles: a sincere consultant; a supporter helping the students-clients to understand their problems; a stimulator; a neutral observer.

The analysis of the types of teaching according to indicator (6) student roles showed, that the traditional type of teaching is characterized by the passive role of

students. They act as the objects of management and the executors of the teacher's plans.

Innovative type of teaching gives students an active role in the learning process. Centering on the student suggests that they can perform the following roles: the teacher (the instructor) (in relation to another student); a student (a learner); «supporting role» (in relation to another student); a problem-solver; a personality, independently evaluating the results of his learning activities. The student decides which role is more suitable for him for a particular situation.

The analysis of the types of teaching according to indicator (7) values on which a teacher (an instructor) relies showed, that in the traditional type of teaching the teacher (the instructor) relies on such values as dependence, competition and he strictly controls the pedagogical process.

The innovative type of teaching is characterized by the interdependence of students and a teacher (instructor), a teacher and students cooperate with each other and solve educational problems together.

The analysis of the types of teaching according to indicator (8) advantages of the traditional type of teaching include ensuring the «movement» of knowledge from a source, for example, a book, a teacher or a film to a student.

The advantages of the innovative type of teaching include the speed of information obtaining, the opportunity to conduct a consultative dialogue with the world's leading experts in a particular field, participate in the electronic conferences, as well as the formation of virtual groups of students, the skills to work in a team, to interact, to communicate, to develop the leadership skills. It is very important for the team to work on the creation of joint projects, images of the future.

Along with the advantages of traditional and innovative types of teaching, there are some disadvantages.

The analysis of the types of teaching according to indicator (9) disadvantages showed, that in the traditional type of teaching there is the manipulation of the individual, the danger of forming a man-functionary who lacks cognitive interest and his own

internal motivation for learning and acquiring knowledge. There is the predominance of training exercises at the classes.

Disadvantages of an innovative type of teaching based on the use of information and communications technologies are the loss of the guiding role of the teacher (the instructor) in the learning process, the predominance of inductive learning strategies. Many non-verbal channels of communication of the teacher (the instructor) and the student may be blocked; there is no direct contact the teacher (the instructor) and the student. The innovative type of teaching is mainly used at the advanced stage of teaching.

The analysis of the types of teaching according to indicator (10) main results showed, that the use of the traditional type of teaching is the willingness of students to perform a social role within a given standard, the efficiency of teaching, which manifests itself in the complete acquisition of knowledge and skills. The standard results are the criteria of knowledge acquisition.

The main result of using the innovative type of teaching is the formation of knowledge and skills, a creative person, able to work in a group; leadership qualities of students, value relationships in the student groups, academic autonomy of students.

The education system of Russia and China has similarity, which is that it is necessary to pay attention not only to the teaching process, but also to the upbringing of a person.

According to Confucius, an ideally educated person should have high qualities: nobility, desire for truth, truthfulness, reverence, rich spiritual culture. The teachers of Russia and China strive to realize the idea of comprehensive development of the personality: moral, mental, aesthetic and physical development of a person. The great humanists of Russia, religious leaders, philosophers, politicians, musicians, historians noted that the teaching of knowledge must necessarily be accompanied by moral education. This understanding of people's lives united the thinkers of China and Russia.

Thus, a comparison of traditional and innovative types of teaching led to the conclusion that the innovative type arose as a response to the emergence of ICTs and the broad opportunities for ICTs use in the educational system. According to the theory the

teacher (the instructor) cannot adhere to several different approaches to teaching, since they are based on opposing theoretical grounds. As a result of the analysis of the problem of the choice of types of teaching and, accordingly, approaches to teaching, which determine the type of interaction between the teacher (the instructor) and the student. It is established that the logical boundaries separating these approaches should not be carried out in practice. The teacher can adhere to different types of teaching in his practical activity, and therefore, different approaches to teaching.

Modern information technologies provide the teacher (the instructor) and students with the possibility of interactive communication. The use of modern information technologies will allow diversify traditional teaching, to attract teachers (the instructors) with a world-wide name to the teaching process.

Integration of ICTs and pedagogical technologies is one of the most important problems of modern education, which is at the center of attention of the pedagogical community of the whole world. The problem of using ICTs in education is a global one. The integration of ICTs and pedagogical technologies is a worldwide process in which the results of modern pedagogical thought can be cognized and evaluated in comparison with the general results of world science.

The appeal to the experience of use of ICTs in education of Russia and China is due to the fact that these countries have accumulated a rich positive experience of the integration of ICTs and the pedagogical technologies, and at the same time the difficulties and problems that these countries faced in the way of integration of ICTs and the pedagogical technologies are identified. The innovative type arose as a response to the emergence of ICTs and the broad opportunities for the use of ICTs in the educational system. As a result of the analysis of the problem of the choice of types of teaching and, accordingly, approaches to teaching, which determine the type of interaction between the teacher (the instructor) and the student, it is established that the logical boundaries separating these approaches should not be carried out in educational practice. The teacher (the instructor) can adhere to different types of teaching, and therefore, the approaches to teaching in his practical activity. According to the theory the

teacher (the instructor) cannot adhere to several different approaches to teaching, since they are based on the opposing theoretical grounds.

The use of modern information and communications technologies in the system of education of different countries, for example, Russia and China, will make it possible to intensify the scientific contacts, the exchange of experience and knowledge in the scientific videoconferences and the video master classes, to diversify and to optimize the traditional teaching, to involve in the video conferencing the scientists, the teachers (the instructors), the professors with a world-wide name, regardless of their nationality, citizenship and territorial remoteness.

The modern information and communications technologies allow the teacher (the instructor) and the students to see and hear each other in real time. The teachers (the instructors) can work simultaneously with several classrooms of students located in different places of the globe. They have the possibility of interactive communication. In the same way the teachers (the instructors) can take tests and exams. Students will be able to learn from the world-class specialists, adopt their experience in different fields of knowledge without leaving the university.

Modern universities create an environment in which each student can receive an impetus for the development of his intellectual and creative potential. Universities equipped with the multimedia classrooms, the interactive classes, the research laboratories, the world-class congress centers, contribute to the formation of a new university community with a high information culture and a cult of educational innovation.

Countries easily integrate into the global educational space and gradually move away from the inefficient models of teaching to the advanced ones, based on the introduction of new generation electronic educational resources into the educational process. Innovations related to the active use of ICTs in society and education is both the result and the effective means of transformation of society and education. High technologies and educational innovations are not abstract concepts but real phenomena that are parts of the everyday life of each student.

In the modern educational space the sources of the new educational environment are actively formed and are being developed. Many of these sources have an impact on

the process of acquiring knowledge by students. The process of acquiring knowledge continues throughout life and the slogan of modern education is «Lifelong Learning».

Education is an open, self-developing system, changing under the influence of the internal contradictions, factors and conditions. Modern ICTs expand the possibilities of traditional education, influence the features of its functioning and lead to the emergence of sources of a new educational environment, which in turn affect the traditional teaching and the process of acquiring knowledge. The change in education is caused by the active use of ICTs in the teaching process. Modern education involves the active use of the Internet and the digital technologies in the teaching process (for example, electronic pedagogy), a model of translation and preservation of knowledge, management of one's own educational trajectory and educational activity.

Teaching based on the use of modern ICTs in Russia and in China will improve the quality of education and achieve the relevance of education to the developmental needs of the individual and ensure that the educational system conforms to the requirements of the twenty-first century. The innovative pedagogical searches in the field of use of constantly improving information and communications technologies in modern world education are revealed and grounded. Appeal to the use of ICTs in the education system of China is due to the fact that this country has accumulated a great experience in the implementation of ICTs in the teaching process. A similar process takes place in Russia, which is at the stage of active introduction of ICT into the education system.

Table 1

Comparative Characteristics of Teaching Types

	Types of Teaching	
Indicators	Traditional / Conventional	Innovative
1. Approach to teaching	Administrative	Based on the ICTs use
2. Dominant idea	Education for life	Lifelong Learning
3. Goal	Formation of a certain system of knowledge, abilities, skills and personal qualities, acquiring and retaining specified knowledge.	Formation of digital skills, value relations in the group and adaptive skills, development of critical and creative thinking, interpersonal relations and cooperation skills.
4. Centering on the subject of activity	Teacher-centered	Student-centered

5. Instructor roles	Central, main and active role of a teacher, a dominant, «guiding» role in the learning process.	Facilitator Mentor Sincere consultant Supporter Stimulator Neutral observer
6. Student roles	Passive role, organisms that can be directed, executors of the plans of a teacher (an instructor)	Active role in the learning process: a teacher (an instructor) (in relation to another student); a student (a learner); «supporting role» (in relation to another student); a problem-solver; a personality independently evaluating the results of his learning activities.
7. Values on which a teacher (an instructor) relies	Dependence Competition Control	Interdependence Cooperation Equality continued
	Types of Teaching	
Indicators	Traditional / Conventional	Innovative
8. Advantages	Providing «movement» of knowledge from a source (a book, a teacher or a film) to a student.	Speed of information obtaining, opportunity to conduct a consultative dialogue with the world's leading experts in a particular field, participate in the electronic conferences. Formation of virtual groups of students, skills to work in a team, to interact, to communicate, to develop leadership skills. It is very important for a team to work on the creation of joint projects, images of the future.
9. Disadvantages	Manipulation of the individual, danger of forming a man-functionary who lacks cognitive interest and his own internal motivation for learning and acquiring knowledge. There is predominance of training exercises at the classes.	Loss of the guiding role of a teacher in the learning process, predominance of inductive learning strategies. Many non-verbal channels of communication of a teacher and a student may be blocked; there is no direct contact of a teacher and a student. The innovative type of teaching is mainly used at the advanced stage of teaching.
10. Main results	Students perform a social role within a given standard, efficiency of teaching, which manifests itself in the complete acquisition of knowledge and skills. Standard results are the criteria of knowledge acquisition.	Formation of knowledge and skills, a creative person able to work in a group; leadership qualities of students, value relationships in the student groups, academic autonomy of students.

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