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# INFORMATION TECHNOLOGIES AND THE FUTURE OF EDUCATION IN THE REPUBLIC OF KAZAKHSTAN

**Abstract:** The aim of the article is a comprehensive approach to addressing the digitalization of education in the Republic of Kazakhstan based on identifying problems in this area, forming priority tasks and possible ways to solve them. Implementation of IT-programs in the learning process making serious additions to the pedagogical requirements, ethics, and discipline of students also the content of the disciplines. All these aspects are becoming especially relevant today when the quality of education is becoming a strategic task and the key to the successful development of the country's economy in the digital era. The article touches on the problems of the modern "digital" generation, its dependence on communication in social networks and instant messengers, the impact of this dependence on health and the level of knowledge. The algorithm for educational technologies will be the main educational goals: the ability to think outside the box, be creative in solving problems, and develop logic and intelligence. Therefore, to formulate requirements for training ICTs, it is necessary to implement measures to assess the effectiveness of implemented programs based on experimental data. Such studies are being conducted today to improve the quality of the educational process, which means that they can be used for ICT. In conclusion, if to base on the results of the survey, the main problems were identified and a number of tasks were set for a deeper study, a general idea was formed on the scope of the forthcoming work and the goals for its achievement.

**Key words:** digitalization, education effectiveness.

## Introduction

Modern pedagogy is a comprehensive approach to education and requires a detailed analysis of all the tools and instruments used by it. ICTs today are part of this system, but not its purpose. The purpose of the educational process is not only the formation of basic and professional competencies in the student, but also the education of a full-fledged harmonious personality with a broad outlook and a creative approach to solving problems.

Such a goal can be achieved by applying a new type of training that does not limit individuality, but develops independence and initiative with the help of ICT capabilities.

A systematic approach to the implementation of ICT is the main focus of the study, which is based on scientific hypotheses and research by foreign and domestic authors.

Education using ICT requires studying the following issues: goals and objectives of ICT in education, problems of ICT, generation of youth and digitalization, opportunities and prospects of ICT in the Republic of Kazakhstan.

**Aims and Objectives of Digitalization of Education in RK**

Kazakhstan is the heir to the Soviet school, where the predominant characteristic was the executive function and the upbringing of an extensive worldview. Modern trends that have come to us from the European and American undergraduate systems, on the contrary, gravitate towards a clear specialization and narrowing of the complex of general educational disciplines. Predominant focus on the education of active business and entrepreneurship. This is practical and economically justified, since most students combine work and training, paying for education on their own. Consequently, the cost and duration of training will depend on the volume of credits and the number of disciplines. At the same time, universalism, which A.V. Gusev [1] points in his article cannot be considered outside the context of the use of ICT.

Citation: "But the most important thing for society and education was that universalism unites people into society, and narrow specialization divides them. Universalism gives humanity a universal worldview, includes it in planetary and global processes, and specialization closes it in the framework of its profession and separates it not only from humanity but even from its closest neighbors" [1].

It should be noted that it is ICTs in the modern world of globalization that cover all areas of the scientific and public life of humanity and can become an assistant in the self-development of the individual. Nevertheless, the ability to use these benefits, you need to learn how to choose the right book from thousands of useless and even harmful. The author also lists the tasks of ICT, which indirectly confirm the universality of the acquired knowledge and skills [1]:

- find, select and interpret information;
- detect relationships, correlation and patterns;
- model, predict and hypothesize;
- check the reliability and accuracy of all observations and conclusions;
- review and improve their research activities;
- communicate their results to others and discuss them between them;
- evaluate your work;
- develop creativity and responsibility.

These tasks are the universal goal of modern education, to get a competent specialist who can adapt in a changing business world and improve, using all acquired skills and abilities using ICT.

Information and communication technologies are indispensable in a competitive economy where the analysis of large statistics is required. High processing speed and forecasting of the prospects for the development of events in the markets of trading, stock and banking operations are required.

E.N. Klochkova and N.A. Sadovnikova consider the introduction of digital technology not only as a means, but also as part of the training: "Digital transformation involves a qualitative change in the content of the educational process, which, ultimately, will lead to the satisfaction of the needs of all its participants" [2].

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This approach determines the modern direction of scientific and pedagogical development, which will take into account new design principles and methods (BIM technologies), analytical and statistical capabilities, as well as forecasting.

New opportunities will require correction of the content of the educational process, a detailed study of innovative technologies for productive training and coursework, and in the future – work projects.

**ICTs challenges**

Information technology nowadays getting huge importance in all areas of professional activity, including in the educational process. A growing number of operations are carried out using specialized software. The trend to increase the level of education in the field of IT will grow, as an increasing number of industries are equipped with technical equipment that requires professional knowledge of specialized programs or the basics of computer literacy.

ICTs make our lives more convenient and simple in everyday and work activities, but at the same time they carry certain threats, which are widely written by doctors and psychologists in many countries. Such threats may include inactivity, blurred vision, distracted attention, memory impairment, psychological stress from an excess of information and the need to respond to many messages at once. Young people are the first to be at risk, as they are the most suggestible and easily adopt all fashion trends. A product advertised and promoted by IT companies is not always useful to consumers, without experience and knowledge it is difficult to understand the abundance of advertising and the quality of content.

Many studies of scientists from different countries, for example: D.V. Lopatina (2013) and W. Akram, R. Kumar (2017), confirm the negative impact, and even the danger of using many social groups and networks in the Internet space, the excessive enthusiasm of young people for staying on forums and network sites [3, 4].

And, nevertheless, starting from school, nowadays life is closely connected with information technologies, which means that it is time to give them a certain classification. You should begin to study issues related to the rational use of technology and software in educational activities. It is necessary to inculcate the culture of ethics of using ICT, to limit the time for using ICT in elementary and secondary schools, alternating between “technical” and “manual work”.

Are there special education programs and what is known about them? Recently, developing gaming applications for elementary school students installed on phones have become widespread. This idea is interesting, but you need to think about whether it is generally worth giving your children a mobile electronic device or is it better to install the program on a computer and allow it to work for a certain time.

Studies in this area, Kirschner P.A., Karpinski A. (2010) and Fox A.B., Rosen J., and Crawford M. (2009), indicate a decrease in attention and knowledge due to the passion for social networks [5, 6].

For the educational process, the final result is important – increasing the student’s level of knowledge. Often, students are distracted by messages and communication on the network, spend time on games, and solve a lot of issues with the help of tips on the Internet, without spending much effort on the assignment. This leads to a weakening of thinking, a deterioration in the culture of speech and memory.

To overcome this dependence, you should pay attention to the ethics of using modern technologies, and offer software that will allow you to effectively and efficiently use time, teaching and developing, and not replacing memory and thinking.

If to rely on these goals, we can note the positive changes that are most common in the study of foreign languages. Companies and developers have proposed effective methods for learning languages using various educational platforms, sites and applications. ICT data

allows you to quickly memorize words, maintain contact with the teacher, can be installed on a mobile phone. Such technologies provide a variety of exercises and forms for self-study: testing, dictation, composition, listening, pronunciation and listening, performing various exercises, watching videos, translating texts. All these methods can have varying degrees of complexity as the level of competencies increases

M.A. Odinokaya and M.V. Kollerova describes the principles of work of such programs and emphasize their effectiveness and continuity of the learning process. Applications allow you to use them in any free time, using a computer or smartphone [7]. The use of mobile applications in teaching foreign languages meets modern requirements and is a promising area. To this conclusion comes Danilina E.K. in his article "Analysis of the experience of introducing mobile technologies for teaching a foreign language at a university level in Russia and abroad" [8].

The approach to learning with ICT in schools and universities is often limited to using slides and a projector. This is largely due to the ability of educational institutions to provide students with the necessary and high-quality equipment, as well as the teaching staff awareness of innovative teaching methods. The problem also lies in the production of programs by foreign developers who release the product according to their requirements, which do not always meet our realities. Adaptation of such programs, translation into the user's language, etc.

The best way out of this situation is to develop in Kazakhstan its production of the necessary training programs for schools and higher educational institutions. Today, the software can, if not replace, then significantly reduce the use of training notebooks, become an integral complement to textbooks.

At the moment, almost all educational institutions communicate with parents and students using specialized software that contains their academic performance and basic information for training. For example, electronic diaries appeared in schools, and electronic journals in universities reflecting attendance and the percentage of tasks completed. Now you can use the university's website to download handouts, download literature from the repository, view the library's electronic catalog, etc.

**Digital Generation and its Features**

It is should to pay attention to the changes of thinking of young people brought up in the context of the widespread dissemination of digital technology. A generation of peers of Independent Kazakhstan, born in the 90s and early 2000s, have the ability to simultaneously communicate and view information online, are well-versed in search and social networks, actively use modern messengers and applications.

What makes the assumption about the special speed of perception and another logic of actions of the modern generation, which no longer fits within the framework of the "old school" and requires new approaches in pedagogical activity, methodology and content of instruction.

Most often, this statement is erroneous, which is confirmed by many studies: relying on the work of Paul A. Kirschner, Pedro De Bruyckere [9], we can conclude a superficial knowledge of technologies that are often limited by search, gaming and communication skills.

Quote: "A study by Margaryan, Littlejohn, and Vojt (2011) showed that while university students (that is, everyone who was born after 1984 and therefore belong to the digital Aboriginal generation) often use digital technology, the range of technologies they use for learning and socialisation is very limited." [10].

Most young people do not even have deep knowledge of the programs that they use, they do not have knowledge of the principles of their work. Of course, there are many among them who are purposefully passionate about any field of activity and have a number of advantages over peers, may be more informed and have a broader horizon, but there are few such students.

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Increasingly, formalization in the training system lowers the level of knowledge, and modern technologies are involved in this.

A lot of discussion is going on about the benefits and harms of the knowledge testing system and preparation for UNT. In the process of preparation, both students and teachers forget about the purpose of testing, trying to get a high result. The study of subjects turns into memorization of short superficial answers to tests and does not remain in memory for long, because it does not have a solid foundation of knowledge.

The tendency to reduce literary works to an understanding of the main plot and the constant use of the Internet as an assistant and a source of information weakens memory and reduces erudition, making students dependent on smartphones. This is another reason in favor of revising teaching methods and content. ICTs can be a truly effective means of gaining new knowledge and improving the quality and speed of data processing. To do this, it is necessary to create such conditions that knowledge in the school has a deep fundamental foundation, formed with the help of ICT.

Today, Kazakhstan and Russia are continuing to reform the education system to eliminate the problematic issues identified during the assessment activities. In the article "Educational Achievements and the Problem of Development of the Education Systems of the Russian Federation and the Republic of Kazakhstan" authors – V.N. Averkin, K.S. Abdiev, O.M. Zaichenko, G.S. Primbetova [11], many issues of improving the quality of the learning process are raised, the materials of the article are based on a report and international studies on the status and development of education in Russia and Kazakhstan [12, 13].

International studies have made it possible to obtain the necessary information to correct schooling, to pay attention to the in-depth study of subjects, the expansion of natural science experiments in elementary school and the improvement of logical thinking and mathematical abilities in solving non-standard problems.

The usefulness of such studies is obvious, so you should pay attention to assessing the knowledge of students using IT content for training. It is necessary to introduce experimental classes to compare the results of students with different levels of ICT use, to develop and adopt ICTs to achieve national education goals in Kazakhstan.

**Prospects of ICT development in the Republic of Kazakhstan**

Today, broader prospects for the use of ICT in the educational process are opening up in connection with the advent of the distance learning method, this method especially requires the development of programs that allow you to independently study the discipline and be evaluated in the most uncompromising way, when the assessment cannot be influenced by subjective opinion or the human factor.

Various forms of Internet testing, online lectures and webinars are being held now, which will help to expand experience and knowledge between universities or schools at the republican or international levels. Such communication can be useful for competitive purposes, between students of different universities to achieve the highest learning outcomes and teamwork skills.

ICTs can make the learning process more accessible and interesting if various pedagogical techniques are used along with innovative technologies. According to the article Clark A.C., and Ernst J.V. (2009) «Gaming in technology education: The study of gaming can teach life skills for the twenty-first century that employers want… These include analytical thinking, team building, multitasking, and problem solving under duress» [14], learning games can provide analytical thinking, team building, multi-tasking, and problem-solving skills.

For the purposes of productive education, it is necessary to develop a balanced software package for each age group of students from elementary school to higher educational

institutions. The complex should include the most effective training programs of domestic and foreign manufacturers, adapted to the republican requirements of education, science and medicine. This complex should become an integral part of educational equipment and literature, with which educational institutions will provide their students.

Unified requirements for the use of mobile devices in primary and secondary schools, limiting the use of the Internet, and isolation toward the network to internal resources of libraries and educational sites should be developed. Under these conditions, it is possible to significantly reduce the negative impact using positive ICT resources. This area should be deeply studied by various specialists from psychologists and educators to programmers and interface designers in order to receive software packages for the study of the humanities, mathematics, biological and technical disciplines. Based on studies conducted in Russia [15] (Butsyk S.V. "Digital generation in the educational system of the Russian region: problems and solutions"), it can be argued that the above proposals can become an effective value to improve the situation. Having a common scientific and pedagogical base, Russia and Kazakhstan can learn from each other's experience in digitalizing education, which will create favorable conditions for international cooperation and information exchange.

In these conditions, professionally-oriented programs for high school (grades 11-12), colleges and universities deserve special attention. These programs will be crucial for graduates in employment and admission to universities, and therefore should be in demand and popular.

The economic development strategy of Kazakhstan provides for the use of high achievements in the field of BIM- and MIM-technologies, which will simplify calculations and expand the possibilities of engineering solutions in various areas of production. The acceleration of the project process creates the prerequisites for increasing overall economic growth and improving its own scientific and technological base.

Thus, the active introduction and use of these technologies in the learning process will increase the level of their use in production. Specialists who have received such an education will be inviting students and graduates to work with knowledge of these programs, which will increase the level of ICT implementation in production.

**Methods and models of information systems**

ICT systems today can use many different methods, improving the educational process:

- the method of managing the education system through the automation of control mechanisms and accounting of data from the scientific and methodological base, workflow, personal data, financial and business operations.

- a method for the selection of content, organizational forms of training and education corresponding to the tasks of developing a learner's personality in digitalization

- the use of teaching methods aimed at educating an independent personality focused on the development of its scientific potential and intelligence, the implementation of experimental research activities.

- method of creating systems for monitoring and evaluating student performance.

ICT systems have various data modeling tools that easily analyze information and help to predict or find solutions: analytical modeling, simulation, evolutionary modeling, heuristic modeling – all these modeling tools are based on scientific mathematical approaches and, together with innovative technologies, create new types of technology.

It is difficult to compare different approaches in the use of ICTs, since all of them rely mainly on one method. An integrated rational approach using all the methods of the ICT system is an undeniable future in which specialists will be needed to differentiate content and determine the best option for ICT systems for an educational institution or process.

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**Conclusion**

In conclusion, if generally to classify modern software, there are six main categories:

- programs for administrative management and reporting;
- programs for professional activities;
- training programs and applications;
- programs for leisure and entertainment;
- communication programs and applications;
- informational and cognitive content on the network.

All these areas can be used to one degree or another in the educational process, it is important to develop the basic requirements and development strategy of training programs in the Republic of Kazakhstan. Promotion of domestic software that meets approved standards should be the basis for digitalization of the education system.

To summarize, we can identify the main problems and the necessary actions to improve the situation.

Problematic issues of ICTs implementation in the educational process:

- specialized requirements and standards for educational ICT and programs are needed;
- organization of work on adaptation and issuing recommendations for the use of foreign training programs in secondary, technical and vocational and higher education systems of the Republic of Kazakhstan is required;
- not enough domestic developments in this area;
- no attention is paid to the development of uniform requirements for the education of ethics and educational discipline of the use of mobile devices during classes and in public places;
- legal, legislative and economic conditions are necessary for using accessible educational content, the cost of which could be justified by the results of its implementation. Many companies offer free installation of licensed programs in educational institutions for the subsequent use of these programs in production;
- insufficient level of awareness of teachers about the innovations and opportunities of modern ICT;
- the workload of teachers working with paper work, the irrational distribution of priorities, forms on the residual principle the improvement of their own qualifications, raising the pedagogical and scientific level.

The possibilities of using innovative training technologies suggest the gradual introduction of a whole system of regulatory and legislative requirements. However, there are many opportunities to improve the use of ICT in the educational process today:

- compiling a list of well-known and easy-to-use programs and applications that can improve the learning process;
- description of the possibilities of using these programs in training;
- conducting courses and seminars for advanced training of teaching staff at various levels: university, republican, international;
- issuance of grants and various competitions for the development of ICT in the education system;
- creating conditions for software development by students, undergraduates and doctoral students of universities. Organization of teamwork of related specialists on term and diploma projects or dissertation research;
- development of a classification of training programs according to criteria.

Innovative technologies are one of the most changing and demanded development factors; it is science and education that should be the pioneers of many areas of ICT in the future

perspective. Consequently, ICT is turning into a separate area of scientific and educational activity, which requires Russian classification and in-depth study of each issue.

The ICT system has a flexible structure, many technologies are multifunctional and should be considered as part of a social platform on the Internet. The continuity of ICT with the Internet space, the socialization of the personality within it, the influence of blogs and forums on the upbringing and morality of young people affect the creation of another image on the network, with a focus on education, intelligence and success in achieving goals.

Competitions, useful popular science magazines and the organization of youth events, sites of educational, developmental and cognitive content should be presented in the most popular social networks and sites of educational institutions. By "advertising" the image of a successful educated young man, one can achieve the goal of increasing interest in education and comprehending one's capabilities with the help of a developed ICT system.

In these conditions, the development of sites of educational institutions becomes the main task for the promotion of ICT technologies. Any information about scientific, competitive or educational activities of organizations, enterprises, schools, universities and colleges should be available to a PC user. Submission of applications for participation or communication with the organizers should not be difficult.

ICT will also make major changes to the activities of libraries; electronic resources are becoming increasingly important. Downloading a book, using audio listening to the lesson, viewing information in the electronic encyclopedia of the library (excluding the wikipedia resource), viewing the video lesson, etc. should become a standard practice of teaching. Specialized ICT libraries can provide links to sites, recommend literature or sections on a given issue. This will increase independence in the study of the issue, improve the literacy of the use of technology, expand the opportunities and access to information for all students.

In the organization of work and promotion of ICT, an important aspect is occupied by pedagogical practice. The teacher brings in many ideas and methods for organizing the lesson, which can be more interesting and effective using ICT devices and technologies. This is a separate issue requiring particularly intensive study and identification of the most acceptable and useful properties of the innovative teaching method.

This method meets the modern needs of youth and the goals of modern education, as it can stimulate teamwork, identify leadership qualities, support initiative and innovative solutions. All this corresponds to the idea of a new approach to training and the formation of a self-sufficient person with a clear idea of the methods and means of independent work using innovative technologies.

It should be noted that ICTs can stimulate inventive activity, independently form their own video lessons and trainings, develop projects, make the necessary calculations. This is already possible with the right approach to pedagogical work.

Based on the issues discussed, it becomes clear that the introduction of ICT in education affects many areas of scientific and pedagogical activity, this is a gradual process that will always improve and require research and experimental implementation practice.

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