

## Influence of Postindustrial Society Technologies on Modern Education

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### Abstract

The article is devoted to the study of characteristic features of the education system of developed countries and Russia in the modern postindustrial era. The priority of knowledge as a system-forming element of postindustrial society leads to new trends in educational processes. The authors' study is focused on these transformations in the theory and practice of education.

**Keywords:** Social philosophy; Pedagogy; Education; Postindustrial society; Human capital; Innovations.



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### 1. Introduction

The processes occurring in the countries that are leaders in postindustrial development, in the pool of which the Russian Federation is included, are determined by objective needs of humanity, which has reached a new stage of its development (Kuzmenko, 2011). "Postindustrial revolution", which, according to social philosophers, began in the mid-20th century, is directly related to the emergence of information technologies of a new quality, to the computerization of spheres of human life and society. Peculiarities of postindustrial development dictate new requirements imposed on a person and on those social institutions that ensure his/her vital activity, first of all, on the institution of education. The priority of this social institution in the social structure is currently predictable. The qualitative growth of the information component in modern society and the development of means related to this component pressed material resources (land, capital, etc.) and brought a nonmaterial resource – knowledge – to the fore.

This circumstance has become a subject of close examination by domestic and foreign researchers, especially in recent decades (Clark, 2011a; Gref, 2015; Kochetkov and Kochetkova, 2009; Kudzh *et al.*, 2015; Ortega-y-Gasset, 2010; Skorodumova, 2008). In socio-humanitarian sciences, an interdisciplinary cluster has been formed, where phenomena of postindustrial society and knowledge as its key resource are viewed from different perspectives. Hence is the increased research interest in modern education and forms of its institutionalization.

The position of scientists is justified. A person who can use the acquired knowledge in his/her area of competence becomes the driving force of social progress; he/she becomes a bearer of a special type of value, the so-called "human capital" – the total of human competencies. The need for the constant accumulation of this "capital" and the skills of its effective use form modern requirements for education. Investments in human capital are primarily investments in new forms, means and methods of education that accompany a person throughout his/her life. Pressing issues of education are becoming an important topic of theoretical research, including in the theory of pedagogy and social philosophy.

### 2. Problem Statement

Modern education is a result of the half-century coevolution of social institutions in the emerging postindustrial society of developed countries; this system is complex by its content and methodology and is primarily based on advanced technologies: information, administrative, pedagogical and other ones. The main goal of education is a requirement to increase the "capitalization of a person", i.e. ultimately his/her competitiveness in a variety of markets for goods and services. The result of training should be expressed in the student's adequate and effective response to challenges of the social environment through processing, production (generation) and introduction of new knowledge into the scope of his/her activities.

In this case, the specific "relevance" of modern education should be noted; it is focused on the fact that the knowledge produced by students must meet pressing needs of society and, thus, be of applied nature. The attributive characteristic of modern education is expressed in this phenomenon – a direct link between education and continuously changing social existence, in particular – between educational institutions and economic, political and other structures. Criticism of applied nature of the modern ideal of education is a subject of scientific discussions. Some researchers rightly believe that "applied knowledge cannot be self-sufficient" (Evreeva, 2014). In particular, there arises a problem of continuity in the development of scientific knowledge, its close connection with the scientific worldview, with the general genesis of science, which reflects a deep worldview process. Transformation of applied science into a certain set of technological data and techniques is one of the threats resulting from trends in modern education. Taking it into account in the context of postindustrial transformations is a condition for the formation of a situation of searching for mechanisms for their prevention (Koval, 2013).

Global educational trends raise an issue of ensuring the competitiveness of the educational system of the Russian Federation, the requirements for its postindustrial model of education (Kudzh and Nazarenko, 2014;

Matronina, 2013; Zaitseva, 2014;2015). Conceptually, such model should reflect the essential links, proper-ties, and attributes of the actual education system and all its levels: preschool, secondary and higher education and a system of increasing professional competencies (supplementary education). Obviously, a degree of its effectiveness depends on the degree of public involvement in the management of education. Hence appear the prospects for such organizational form of education, implemented in the Russian Federation, as the state-public administration. This approach can be exemplified by an increase in the role of an employer in the teaching process of a higher education institution, the emergence of external basic departments in the structure of faculties.

Another characteristic feature of modern education is its pronounced dynamism of the teaching process. The variability of curricula and their methodological support is increasing – this increases the potential for students' free choice of the content, forms, methods, and means of training. The permanent rotation of training programmes provides a significant advantage over the classical system. Such innovations play a great role during the reform of the education system in the Russian Federation, more widely – in countries-leaders of the postindustrial era, when searching for the ways to improve education that meet the needs of the time (Matronina, 2014).

The applied nature, dynamism and variability of the modern educational model, expressed in the ability to respond adequately to the educational demands of society, become the key to its effectiveness. Mobility in education means the opportunity for any student to build his/her educational trajectory, which most fully corresponds to his/her abilities and professional needs.

### 3. Methods

The comprehensive analysis of the modern educational model assumes the study of provisions of modern educational concepts, both domestic and foreign ones, in the context of the development of the world labor market. It is necessary to make theoretical conclusions from the monitoring of the problems of the education system (all its levels). Similar actions should be supplemented by consideration of normative legal documents, recommendations of consulting agencies, implementation of market research of the educational ser-vices market. The latter includes research in the sphere of promotion channels, competitors, consumers, prices, advertising, sales promotion methods, personnel, training process, the internal marketing environment of educational institutions.

The following results should be a logical outcome of the chosen research strategy: the identification of mistakes and problems at all levels of the education system; the process of generalization, the formulation of new ideas for the structure of education; primary testing of knowledge; setting new tasks, developing or selecting the most effective forms of educational activity. In this article, it is im-possible to conduct such a full analysis of the educational model. However, some important issues can be considered.

### 4. Results

The pace of development of the postindustrial society correlates with a number of factors: the quality of communication, the information transfer rate, the ability to operate knowledge, etc. The effectiveness of the educational environment of such society depends on the extent to which these factors are taken into account.

Financing for education is a key criterion for the awareness of the importance of this circumstance at the state level. Reflecting the degree of attention paid by the state to education, expenditures on this sphere are considered one of the key indicators of social development.

In this position, Russia looks decent, compared with other countries-leaders. This requires a little explanation. Comparing the expenditure on education of developed countries, including Russia, it is necessary to take into account that the level of national expenditure on education is a relative value that is calculated as the total volume of public and private expenses on education during a calendar year, including state budgets of all levels, private funds, foreign loans, grants and donations from international institutions and non-governmental organizations. Collectively, this is called a budgetary system and only its cumulative overview can give a complete picture of government funding. The total expenditure of the budgetary system on certain directions may significantly differ from those that are included in the federal budget. That is why, for example, a share of expenditure on education in Russia that is rather modest on a scale of the federal budget (3.7% of all expenditure items of the federal budget for 2017) increases up to 10% when considering it in a scale of the budgetary system. This circum-stance makes it possible to understand the stable position of the education system of the Russian Federation among the advanced countries, which is often not fully understood. Such misunderstanding creates a peculiar paradox in the media: the supposedly “low” funding, which is spoken about in the information space, does not interfere with the high achievements of Russian students at various international venues – contests, academic competitions, and other events. For example, in 2017 Russian students won 18 gold, 14 silver and 6 bronze medals at international natural-science competitions. This is the unofficial first place in the world competition rating.

Despite this, it should be noted that there are still serious problems in Russian education: geographical and financial inequality of the applicants' opportunities, the weak readiness of university graduates to work effectively after graduation, the low internationalization of higher education institutions, etc. (Matronina, 2013;2014). The following aspects are also significant: the early and more careful selection of the most successful students, which is weakly expressed in the Russian educational system “preschool – secondary – higher education”, the support of the highest motivation of a child, and subsequently – of a young man, both from the family and educational institutions. The latter circumstance plays an important role in the formation of students' moral and volitional qualities that make it possible to strive for high performance in studies and, subsequently, in the professional activity.

In general, these problems are comprehensive in nature as they affect many important parameters, for example, the position in the list of the countries, which are more suitable for educational migration. The first lines of this list are traditionally occupied by Great Britain, Canada, the USA, Germany, France, Australia, and Japan. Russia is not on this list of leaders. Project “5 – 100” implemented by the Government of the Russian Federation, according to which 5 leading universities of Russia must enter the 100 leading universities of the world, aims to establish modern university culture in higher education. It is planned that this will be the basis for improving the rating of Russian universities on a number of criteria (Clark, 2011a).

To qualitatively update Russian universities means to go from the autarky of a classical university to new generation universities. Such a university is aimed at implementing 3 main functions: teaching, scientific research, and practical implementation. The system analysis of modern leading universities such as Stanford, MIT, Cambridge, Warwick, gives a matrix of an innovative university (Clark, 2011b;2011c). Their policies are actually the synthesis of an educational, scientific and industrial center with a huge role of management that unites these different spheres of life. This kind of synthesis allows solving strategic tasks: the creation of new technologies and social innovations; unification of the global, national and local issues; expansion of the communicative space and sphere of public activity; purposeful development of multilateral cooperation; trust in universities on the part of society and business; training of scientists-entrepreneurs, etc.

The entrepreneurial university concept by H. Thorpe and B. Goldstein can serve as an example of theoretical developments in this area of synthesis of education, science, and industrial practice. American scientists assume that a new generation university should be deprived of bureaucratic heritage, putting “culture above structure”, it must be ready for risks in administration, meet challenges of complex social decisions in theory and practice. Putting the production of innovations at the forefront, a new-breed university should determine the key role of the humanities and social sciences for the successful development of high-tech business in any sphere related to the production of goods and services, thereby directly or indirectly promoting partnership between scientists and entrepreneurs (Thorpe and Goldstein, 2010). In Russian higher education, this approach is tested within the framework of a long-term interdepartmental public-private partnership program. It is aimed at the formation of personnel for various sectors of society. The development of new promising markets based on high-tech solutions that will determine the development of the world and the Russian economy in 15-20 years is the most important direction of this policy.

In addition to the transformations of content-related and methodological issues in the modern educational process, it is necessary to take into account permanent changes in the means of education, including in the means of tele- and Internet-communication with students. Revolutionary changes related to the receipt, storage and processing of large information arrays through computers, as well as the transfer of these data to any place in the world due to the worldwide network of computer systems (the Internet), became an integral part of modern postindustrial society. The Internet revolution affected education, too. Its results can be called intermediate, since as it advances, many bifurcation points arise, leading to the emergence of completely new views on traditional pedagogical approaches and techniques. Promising trends related to an increase in the percent-age of online study modes in the educational process, generalization, systematization of the educational material are obvious. The Internet makes the arrays of training courses accessible and simultaneously anonymous, integrates artificial intelligence services into the educational process, which focuses on the user's search queries. There is a generation conflict, which fixes the changing of educational paradigms. For the older generation, online education is problematic and subject to criticism on various parameters, for the youth it is quite natural. Moreover, the younger generation freely operates its technical storage media – gadgets, organically perceives those computer resources that are provided to users as Internet services (e-mail, teleconferences, file archives systems, remote computer management in terminal mode, World Wide Web (WWW, W3) – hypertext (hypermedia) system designed to integrate various network resources into a single information space, etc.).

The readiness of the younger generation for revolutionary changes in education is confirmed by a wide range of studies. For example, in 2018 the Russian State Social University (RSSU) held a round table on the results of scientific re-search, the empirical base of which included materials of the survey of different categories of students in higher and secondary education institutions of the People's Republic of China. Let us recall that China is currently a leading state in the implementation of innovations in educational processes; as a result, it occupies top positions in international educational ratings, in particular – among universities. Based on the analysis conducted, the following trends in the methodology of teaching a modern Chinese student have been revealed. Firstly, the area of traditional methods in teaching tends to decrease, as the analysis shows – the younger the respondent, the less he/she is interested in this area. Secondly, there is a multiple request for innovations in teaching methods. It is important to note that the key elements of this request of the younger generation of Chinese students are as follows:

- modernization and automation of the learning process, the use of modern technology (multifunctional gadgets), modern software, Internet technologies;
- introduction of new interactive forms of training, the emphasis on modern pedagogical and psychological technologies, the use of new forms of motivation (leadership, the formation of a competitive environment, game and other simulation models), stimulation of creative approaches to mastering the training material;
- the use of event marketing techniques, the supply of sociocultural services, the organization of cultural programs of different topics and different levels of complexity in the field of the student's specialization;

Obviously, the data obtained at the round table in the RSSU fit into the existing educational trends.

An emphasis on the so-called adaptive competence, i.e. skills aimed not only at raising the IQ (intelligence quotient) but also at developing the EQ (emotional quotient), should be considered as another educational innovation

in relation to a postindustrial university. The increased attention to adaptive abilities and emotional development of students in the 21st century is caused by the increased competition on a global scale, increasing emotional, psychological pressure on students, deepening the risks of stress.

## 5. Summary Findings are as Follows

1. Nowadays, the most obvious problems of Russian education are as follows: formalism and rapid obsolescence of knowledge; the detachment of training programs from interests, students, and employers.

2. The generalization and study of world trends in education led to the formulation of the basic principles of a new educational model. Among them are the following ones: the strategy is more important than tactics, the quality of the learning process is more important than the structure of the educational system; the goals of the educational system are the same, and the means of their achievement are different.

3. A new generation university should be created and function on the basis of relevant theoretical and applied research based on three principles:

- o the educational value of knowledge;
- o the need for learning through action;
- o unification of professional sciences and humanities.

In this regard, the promising areas of university evolution are as follows:

1. Corporate universities, which are not only training centers but also strategic partners of companies in their adaptation to a rapidly changing business environment;

2. Business schools as factories of new knowledge of effective management of organizations. They are engaged in the development and implementation of programs in close connection with the business. The internationalization of education and research is a priority here;

3. Online education, which includes distance education as an opportunity for online education. It is characterized by its availability at anytime from anywhere in the world (if the Internet connection is available), individual user customization (viewing speed, training intensity), free-of-charge basis and equal access to training.

It is obvious that the postindustrial strategy of education implements mechanisms of adjustment for new needs, controls the results of education, rather than its process, develops the export of educational services, seeks to support technological educational “start-ups” and spread successful educational models to the whole system.

## 6. Conclusion

A new generation university is an educational organization striving to form a postindustrial personality on the basis of the development of professional qualities, worldview attitudes, and value orientations. Such a person, who has modern professional, philosophical and social competencies, can better adapt in postindustrial society, integrate into its social institutions and effectively fulfill his/her “human capital”. An incentive for intercultural communication that is natural in the mobile and global world is also important. In this regard, joint scientific, technical and humanitarian training can form a demanded personality of the 21st century – an innovator (Otyutsky, 2011).

Let us quote the words of Lee Kuan Yew, the first Prime Minister of the Republic of Singapore, one of the founders of Singapore's “economic miracle” and a successful reformer of the national education system, who wrote in his book with a specific title “From Third World to First” as follows: “The new line of section will take place in the world between those who have knowledge and those who do not. We must learn to become part of the knowledge-based world” (Lee, 2015).

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