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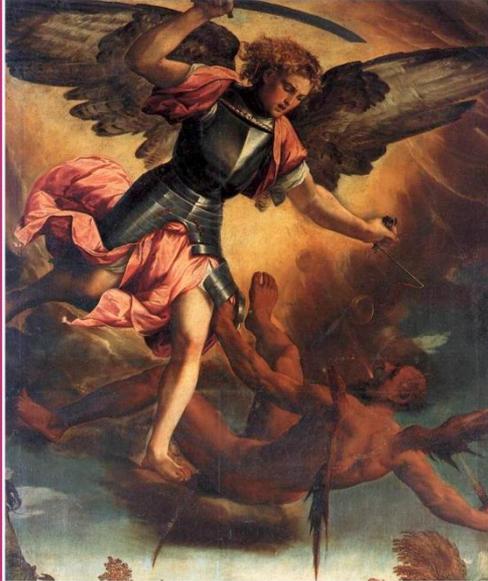
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Universidad del Zulia
Facultad Experimental de Ciencias
Departamento de Ciencias Humanas
Maracaibo - Venezuela

Social Network Technologies as a Transformation Factor in Modern Vocational Education

Liliya Matronina¹

¹MIREA – Russian Technological University, 78 Vernadskogo Ave.,
Moscow, 119454, Russia

l.matronina95@mail.ru

Olga Skorodumova²

²Russian State Social University, 4 Wilgelma Picka Str, bld. 1, Moscow,
129226, Russia

skorodumova-67@mail.ru

Boris Skorodumov³

³Financial University, 49 Leningradsky Ave., Moscow, 125993, Russia

skorodumov-boris@bk.ru

Abstract

In this paper, the authors present the philosophical and methodological analysis of the influence of modern social networking technologies, based on collective strategies for existing and generated knowledge development, processing, structuring and storage, on new strategies formation in vocational education. The conducted research

revealed that social network technologies development necessitates the search for new strategies in vocational education, as well as new education management methods introduction in the university cluster that is adequate to modern social conditions. In conclusion, a project-based approach to education has a significant heuristic potential.

Keywords: network society, social technologies, crowdsourcing.

Las redes sociales como factor de transformación en la educación profesional moderna

Resumen

En este artículo, los autores presentan el análisis filosófico y metodológico de la influencia de las tecnologías de redes sociales modernas, basadas en estrategias colectivas para el desarrollo, procesamiento, estructuración y almacenamiento de conocimientos existentes y generados, en la formación de nuevas estrategias en la educación vocacional. La investigación realizada reveló que el desarrollo de tecnologías de redes sociales requiere la búsqueda de nuevas estrategias en la educación vocacional, así como la

introducción de nuevos métodos de gestión de la educación en el grupo universitario que sea adecuado para las condiciones sociales modernas. En conclusión, un enfoque de la educación basado en proyectos tiene un potencial heurístico significativo.

Palabras clave: sociedad red, tecnologías sociales, crowdsourcing.

1. INTRODUCTION

The development of information society is studied with the emphasis on the processes reflecting its specifics. In the beginning of the 21st century, scientists focused, on the one hand, on the qualitative characteristics of information, which led to the emergence of the concept of knowledge societies. On the other hand, they considered the threats arising due to the growing diversity of information interactions, which led to the emergence of the term risk society. Nowadays researchers pay more attention to the analysis of the global network nature of information society.

The development of networks of different levels and the interaction between them in the context of the avalanche-like increase in information flows has determined the demand for new technologies based on collective strategies for the development, processing,

structuring and storage of existing and created knowledge. Taking into account the ongoing social and technological changes in the information society, the authors of the article put forward the following research hypothesis: the development of social networking technologies such as blockchain, crowdsourcing, and collective intelligence necessitates the search for new strategies in vocational education, and the development of approaches to education management in the university cluster that meet the requirements of the modern social reality.

The research goal includes philosophical and methodological consideration of the impact that modern social networking technologies (blockchain, crowdsourcing, collective intelligence) based on collective strategies for the development, processing, structuring and storage of existing and generated knowledge have on the creation of new strategies in vocational education, the approaches to education management in the university cluster aimed at the formation of professional and personal qualities of a student.

The research goal determines the main objectives of the paper: 1) to reveal the specifics of modern social networking technologies: blockchain, crowdsourcing, and collective intelligence; 2) to consider the influence of social network technologies on the formation of professional and personal qualities of a student; 3) to identify new educational strategies and approaches to education management in the university cluster that are aimed at the formation of professional and

personal qualities of a student and comply with the current trends in the information development of society. The theoretical and practical significance of the research includes summarizing the trends associated with the needs of modern education. This can be used in the development of particular methods and educational programs for training highly qualified professions.

2. LITERATURE REVIEW

Nowadays it seems highly relevant to carry out the philosophical and methodological analysis of social network technologies in the context of changing vocational training. This should be done as it is necessary to develop a strategy for modernizing the existing system of education and to define its basic principles and directions. Over recent years, scientists have been actively discussing the main trends and prospects for the transition of the information society from the stage of the post-industrial society (Gavrilenko and Provorova, 2016), to the knowledge society, the risk society (Beck, 2008; Bechmann, 2010; Rosa and Mcwright, 2015; Skorodumova, 2015) and, finally, to the network society (Castells, 2016; Giddens, 2018; Howe, 2012; Kastels, 2018; Ebrahim Abadi & Namdar, 2016).

According to Castells (2016), informatization and globalization contribute to the formation of the network society. The latter is

understood as a dynamic, self-expanding form of the organization of human activities. Due to its intrinsic characteristics, information easily penetrates any barriers and boundaries. Knowledge and information are arranged around networks that represent structures in which relationships between people are carried out not only on the basis of economic interests, but also according to informal norms and rules. Network structure transforms all areas of public and economic life, which boosts the popularity of corporate networks, e-commerce, and mobile telephony. The society of network structures is a new social order (organic self-organization) that in the long run will allow a qualitative change in people's life.

Modernization of society, its economic, political and social structures necessitates the search for and implementation of new social practices. Social engineering is one of these, and it opens up new opportunities for solving transformation problems (Hulme and Goodchild, 2017). Social technologies are an essential mechanism of social engineering. Despite the fact that scientific publications provide different interpretations of this concept, it is used by modern researchers when they analyze social processes trying to solve social problems, design and implement communicative influences. Here we are talking about such technologies as blockchain (Tapscott and Tapscott, 2016), crowdsourcing (Botto, 2017; Howe, 2012), and collective intelligence (Gloor, 2017; Brockman, 2016).

Researchers consider these technologies both regarding the specifics of their application, and the analysis of the social and philosophical consequences of their use. Nowadays a professional should be able to apply social technologies for solving social problems. At present, society needs a fundamental change in the system of vocational education: while professionals who obtained education in the 20th century, as a rule, had enough knowledge to do their work, the dynamic nature of information society demands special qualities associated with constant retraining and a kind of reprogramming of a person in accordance with the changing needs of the rapidly growing business environment. Arapov et al. (2018), Baumann et al. (2014) consider modern education strategies and point out the fact that education should meet the requirements of the modern dynamic world, market economy, and information culture.

The substantial restructuring of the whole traditional (classical) system of education is primarily due to the fact that at present, education is no longer seen as the privilege of a particular social group or an attribute of a certain age group. People study throughout their whole life. A new educational strategy is emerging –lifelong learning. It corresponds with a new approach to education –learn how to learn. Having considered the results of empirical and theoretical studies conducted by the leading scientists, the authors came to the conclusion that there are some problems that require further development and research. These include identifying the specifics of modern social networking technologies (blockchain, crowdsourcing, and collective

intelligence), personal qualities of a professional, substantiating the need for new educational strategies and ways of organizing training in the university cluster.

3. METHODOLOGY

Philosophical and theoretical study of social network technologies as a transformation driver of the modern system of vocational education in the network society determined the choice of methodological approaches to analyzing the outcomes of modern network technologies application and identifying the qualities of modern professionals that comply with these. A systematic approach was applied to consider the specifics of the operation of new network technologies regarding the need to develop the professional and personal qualities of a student. The hermeneutic methodology enabled the authors to clarify the meaning of the basic concepts. The axiological method was used to assess the general trends in the professional and personal qualities of students in accordance with the needs of the global network society.

4. RESULTS

Having conducted the research, the authors revealed the specifics of some social networking technologies such as blockchain,

crowdsourcing, and collective intelligence. In addition to this, they determined their influence on the formation of professional and personal features of a student, with trust being one of them. It was also established that it is necessary to find new strategies for vocational education and to introduce new methods of education management in the university cluster that would correspond with modern social conditions. The authors believe that a project-based approach to education has significant heuristic potential. The international project on reforming engineering education CDIO (Conceive – Design – Implement – Operate) presents an example of the project-based approach to training management and organization as a new model of practically oriented education.

5. DISCUSSION

Information society as a global network structure is formed at the intersection and interaction of networks, including professional ones. Castells defines a network society as a society whose social structure is built around networks that are activated through digitized information and communication technologies based on microelectronics. The network places an individual I under the command of its logic, turning interaction into a way of life. Unlike industrial and the early forms of post-industrial societies, where the individual initiative was dominant, modern network society requires

the ability for collective interaction, which arises from the needs of the network as a whole. Based on the principle of decentralization, network structures are extremely unstable, and their development has a definite nonlinear character.

One can see how actively research innovations are introduced considering the following attractors: the proposed ideas and concepts kind of attract other members of the community, and this leads to a sort of attractors' competition. When the situation becomes unstable, groups may disintegrate. This results in a state of chaos, with possible fluctuations that may bring the system to a bifurcation point. The latter might reveal fundamentally new levels of problem-solving. Nonlinear dynamics of the network functioning does not allow making accurate predictions. Competition between networks for survival, similar to natural selection, gives an advantage to the networks that are able to quickly provide the required information or generate new information for a specific task. This gives rise to the problem of overcoming network redundancy. On the one hand, there is a need to clean it up or filter out the users generating noise, ineffective information, on the other hand – attracting active members capable of producing new ideas and innovations.

The ability to attract the most creative professionals into the network is largely based on their trust in the network, on the belief that their ideas will not be used by someone else. This approach necessitates the search for new forms of the manifestation, storage and

broadcasting of ideas. The success of network interactions largely depends on the degree of trust the network users have in it. Trust is the essential need of information society. A representative example of this is the conditions for the implementation of IBM's e-business on-demand technologies that bring significant economic benefits. The basic idea of the e-business on-demand strategy is the possibility of renting information services and technologies. The hosting center can control the financial flows and financial statements only if there is trust in the integrity and transparency of its intentions.

The blockchain is one of the popular social networking technologies. It provides technical protection of information from changes and makes it available to the entire network community. Having emerged as a technology for using cryptocurrencies (Tapscott and Tapscott, 2016), blockchain quickly became popular. Blockchain ensures equal access to information when transaction results connected with debiting or crediting Bitcoins to an account are available to everyone in the network using this technology, which makes the procedures completely transparent and inaccessible to scammers. The strategic potential of its practical implementation was gradually recognized in other areas. Storage of all transactions and their availability for business analysis makes it possible to assess the reliability of the company (Indriastuti, 2019; Boroomand et al, 2016). Databases on the services provided by lawyers, doctors, and consultants and their outcomes allow one to analyze their professional competency without reading reviews.

Blockchain provides new opportunities for assessing the real relevance of scientific innovations, their marketing cost, and to assess the potential effect of their implementation by analyzing the subsequent operation of the companies purchasing these innovations. Blockchain technologies set the foundation for implementing the principle of trust. Free identification that implies the initial equality of parties entering the system without manifestation of their status differences, accessibility and transparency of information, its protection from distortions and changes, publicity create a favorable environment for interaction based on collective interest, honesty and openness. An example of the successful implementation of this technology in Russia is the Active Citizen Project that embodies the concept of political participation and political socialization.

Network technologies can accumulate the creative potential of different people and stimulate the emergence of original and innovative ideas. Crowdsourcing as a social network technology creates the conditions for solving non-standard tasks, usually on a voluntary basis, involving a large number of participants via the Internet without restrictions on their education level, status, age, etc. One of the pilot projects revealing the potential of joint collaborative research was the SETI@home project (SETI@home), when in 1999 volunteers provided their computers for processing the signals that had been collected by NASA.

The signals were deciphered in the course of searching for extraterrestrial civilizations. Since then, the range of problems solved has expanded (Howe, 2012). Crowdsourcing technologies are getting a wider application in design solutions, joint development of a brand (Citycelebrity), product or content, search for missing people, surveying the public opinion on the most significant issues, voting, search for non-standard approaches to solving problems etc. Crowdsourcing has a significant effect in such fields as economy, politics and social life (Yang et al., 2019; Soo et al., 2019; Sazesh & Siadat, 2018).

The avalanche-like increase in the volume of information in the networks leads to the situation when even in a highly specialized area one cannot grasp and analyze all significant sources, which necessitates the creation of extended expert systems based on the technology of collective intelligence (Brockman, 2016). The specifics of this technology imply that professionals unite in the global network structure according to the synergetic principles of self-organization to solve specific problems and take collective decisions. Such networks accumulate the generated volume of knowledge and innovative ideas that have been processed by the intellectual information systems, as well as professionals involved in these networks. The competition between networks is determined by the quantity and quality of the problems solved, which leads to the situation when the most successful professionals unite into one structure.

In such a network professional are ranked by the system itself, according to their contribution to this network community. Status growth does not depend on external regalia, but on their activity on the network and efficiency of problem-solving. To enhance their capabilities, such networks will seek to merge with each other, so that eventually all existing knowledge and its carriers will be united into the single system called collective intelligence or collective mind (Figure 1). Competition, individualistic self-promotion of a professional or a team is being replaced by the awareness of the importance of collective activity as a key to success in the information age. An example of the implementation of the collective mind technology in Russia was the project the Foundation for Assistance to Small Innovative Enterprises in Science and Technology.

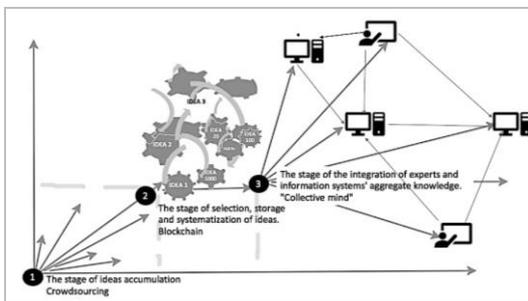


Figure 1: The complex structure of social networking technologies

The practices of creating networks that accumulate the creativity of professionals are becoming highly relevant in modern conditions. Society needs a radical change in education. The dynamic nature of information society demands special qualities of a professional

associated with constant retraining and a kind of reprogramming in accordance with the changing needs of the intensively developing business environment.

There is a need for a fundamental transformation of vocational education. In the past, the goal of education was to obtain knowledge represented by the complex of verified, reliable information, perceived as scientific truth within the relevant paradigm. However, in the network society, the emphasis is placed on the possibility of using this or that information to solve the set goal within a specific project. A modern professional should think in terms of projects. The international project on reforming engineering education CDIO (Conceive - Design - Implement - Operate) is an example of a new model of project-oriented and problem-based learning (Crawley et al., 2014).

The project thinking in the CDIO model (Figure 2) is facilitated by various types of design and educational activities in which students, working as a team, design, produce, and test and implement real objects, processes and systems or their models. Project-based learning contributes to the acquisition of knowledge, reveals the close connection between theory and practice, develops the creative potential of students and their communication skills. Design and educational technologies that form the basis of the CDIO model are a necessary condition for increasing the quality of engineering education

and training would-be engineers. This approach is aimed not only at professional training (specialization), but also at the socialization of students, their understanding of the social and humanistic meaning of their future work.

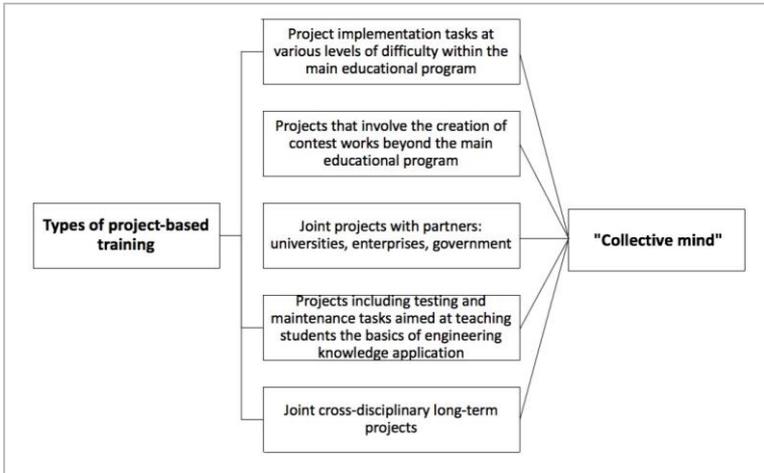


Figure 2: Project and educational activities in the CDIO model

6. CONCLUSION

In this research, the authors revealed the specifics of social networking technologies such as blockchain, crowdsourcing, and collective intelligence. In addition to this, the authors showed their impact on the training of professionals and their personal qualities, with trust being one of these. The article points out the need to find new strategies for vocational education and approaches to education

management in the university cluster. It is demonstrated that a project-based approach to education has a significant heuristic potential. The project-based approach to the management and organization of education is considered on the example of the international project on reforming engineering education CDIO (Conceive - Design - Implement - Operate) as a new model of practically oriented education.

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