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SOCIAL, PEDAGOGICAL AND PSYCHOLOGICAL ISSUES OF INFORMATIZATION OF ADDITIONAL PROFESSIONAL EDUCATION

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Abstract

Today, social and communicative space is the most powerful conglomerate of endless information flows and global networks in which an individual loses the ability to fully and objectively perceive, analyze and use information obtained in the process of communication. The biggest problem is caused by the fact that quite often people, who obtain information from the virtual environment, perceive it as 100% truth and cannot correctly correlate it with the reality, which results in the personality transformations. Such transformation occurs as manifestations of social and psychological phenomenon. Along with this, the information and communication space is a dynamic elevator of individual and status growth, providing an individual with the enormous potential for development, self-expression and self-improvement. In the context of global social transformations, the educational system should be focused on the development of an effective pedagogical paradigm, which is designed to provide favorable conditions for both social and professional development of individuals throughout their lives. Along with this, the informatization, as a global social process, necessitates strengthening of the information orientation of Russian education system, searching for new educational technologies and teaching methods. The article presents the results of a sociological study devoted to the study of the process of informatization of CPE in the Russian region. The most common uses of the Internet in the implementation of CPE programs are established. Promising trends in the development of CPE informatization are identified.

Keywords: Globalization, information society, communication technologies, distance learning, additional vocational education, self-education. .

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1. Introduction

The rapid spread of information and communication technologies (ICT) in the world has embraced, in fact, all spheres of social life and human activities. There is a general informatization and scientization of life; the ICT are widely used at all levels of social organization, being a significant factor determining the development of various institutional systems (education, culture, leisure, etc.) (Mamedov, 2014). The comprehension of a complex and controversial social process of informatization is carried out by scientists and specialists in social, human and natural sciences. Informatization was first noted in the -1960s of XX century in the USA, Japan and other countries, when manufacturing was in need of processing a large amount of information within a short period of time. Currently, the technological aspect of informatization is increasingly narrowing its boundaries, giving way to social and psychological one, which is becoming fundamental in the context of cognition of information reality and the development of information society. It is obvious that the emergence of new professions and research areas requires specialized training using the methods and means of training corresponding to the current stage of informatization of society. In recent years, in Russia and in the world, much attention has been paid to the problems of informatization of education, which are viewed as fundamental and important strategic issues of the development of civilization.

2. Problem Statement

An important condition for the development and successful functioning of the educational system involves informatization. It should be noted that the informatization of education ensures, firstly, an increase in the efficiency of educational activities through the use of information and communication technologies, and secondly, the improvement of the quality of training of qualified personnel, taking into account the requirements of the information society. The positive results of informatization of the educational process include the following: strengthening of mental capacity; development of innovative, logical and operational thinking, as well as cognitive processes; development of motivation regarding the work with a computer for solving educational and professional tasks; socialization; increase in confidence and self-esteem. (Sokolov & Kolin, 2008). As a rule, the informatization of education implies the use of the Internet and involvement of distance learning technologies. Information technologies make it possible to adapt the learning process to each student (Adolf & Stepanova, 2009), make prompt changes in the content of educational programs and the process of education, systematically manage learning activity and change its structure. At the same time, modern information technologies have a psychological impact on student's personality, which leads to such negative consequences as a slowdown in the development of verbal memory and thinking, excessive individualization, formalization of the educational process, exclusion of the emotional components from it, as well as reduction of social contacts. Thus, when studying the problems of informatization of education, it is important to take into account both instrumental and technological, as well as social, pedagogical and psychological aspects.

3. Research Questions

In modern Russia, the informatization of the education system is a part of global process of informatization of society, which is rapidly penetrating into all spheres of human activity. One of the

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important subsystems of the social institution of education is additional professional education, whose role in modern information society is constantly increasing. This is due to the fact that CPE provides for the development and self-implementation of an individual throughout his/her life, supports social and professional mobility and employment of population, contributes to the professional orientation and adaptation of graduates of universities and young professionals. It is worth noting that until the early - 1990s. XX century, additional professional education in Russia was well-organized, regulated and supported by the state system. However, after the elimination of certain sectors of national economy, the system of additional vocational education faced a number of problems, such as the loss of the relationship of educational institutions of vocational education and the real sector of economy, the lack of support from the state, difficult financial situation of the population, the employers' unwillingness to finance employee training, legal framework, etc. However, even under such difficult economic conditions, the CPE system, which was almost completely destroyed, has survived and in spite of mixed current situation it is actively developing. In modern conditions, when the role of information has significantly increased in the society and the process of informatization has rapidly accelerated one of the promising areas of development and an increase in the effectiveness of CPE involves the information and communication technologies. In this regard, the process of informatization of the system of additional professional education in the Russian region was chosen as the subject of research.

4. Purpose of the Study

The purpose of this study is to analyze the process of informatization of the system of continuing professional education in the Russian region. To achieve this goal the following tasks should be performed: to identify the most common uses of the Internet in the implementation of CPE programs; to define the best forms of advanced training and retraining programs; to establish promising trends in the development of informatization of CPE system.

5. Research Methods

In the course of the study the following methods were used: questionnaire survey, polling, comparison, and analysis. The study of the process of informatization of CPE system in the region was carried out on the basis of analysis and comparison of the results of the questionnaire survey conducted among students of the educational programs for advanced training and professional retraining (n = 900); the results of a questionnaire survey conducted among the leaders of small, medium and large enterprises of the Belgorod region (n = 157); the results of a questionnaire survey conducted among specialists of educational organizations implementing CPE programs (n = 103); survey of students trained on the basis of the innovative educational program of continuing professional education Development and Production of Nano-Modifying Additives for Composite Materials for Construction Purposes implemented in Belgorod State Technological University named after V.G. Shukhov (BSTU named after V.G. Shukhov) by request of the enterprise of nanoindustry with the support of the Fund for Infrastructure and Educational Programs (FIEP) (n = 122).

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6. Findings

The challenges of modern information society are very diverse and lead to new requirements for the organization and implementation of continuing professional education (CPE). Today CPE should be focused on social and cultural conditions under which the information becomes more and more widespread. Education in the system of continuing professional education implies the ability to "acquire" new information with the help of information flows, thereby independently building up its own individual educational path in the information environment. If an expert is ready to manage his/her own cognitive process, then it would lead to faster professional growth, as well as social demand and significance (Kopytova, 2010).

In the conditions of informatization and mass network communication, a promising area for the development of education system, including additional professional education, is the involvement of the Internet technologies in the educational activities. According to the results of a sociological survey conducted among specialists of educational institutions of vocational education and training of the Belgorod region, the most common areas of the Internet involvement during the implementation of programs of advanced professional education (advanced training and professional retraining) were identified (Figure 01). More than half of CPE organizations (64.1%) use the Internet to disseminate information about educational programs, 43.7% deliver online lectures and webinars, and 38.8% remotely monitor students' knowledge. Almost a third (27.2%) of the surveyed organizations of CPE teach students remotely, 15.3% provide the opportunity for prompt communication of all participants in the educational process, 11.7% organize forums for the discussions and debates on the program topic. At the same time, 7.8% of the respondents answered that the Internet is not used in their organizations when implementing CPE programs, which is strange, and, in our opinion, can hardly indicate the effectiveness of the educational process and high quality of educational services provided. In the conditions of informatization and mass network communication, a promising direction for the development of the education system, including additional professional education, is the use of the Internet technologies in the process of education. According to the results of sociological survey conducted among specialists of the educational institutions of vocational education and training of the Belgorod region, the most common directions of using the Internet in the implementation of programs of continuing professional education (advanced training and professional retraining) were identified (Figure 01). More than half of the surveyed CPE organizations (64.1%) use the Internet to disseminate information about educational programs, 43.7% conduct online lectures and webinars, and 38.8% monitor students' knowledge in a remote form.

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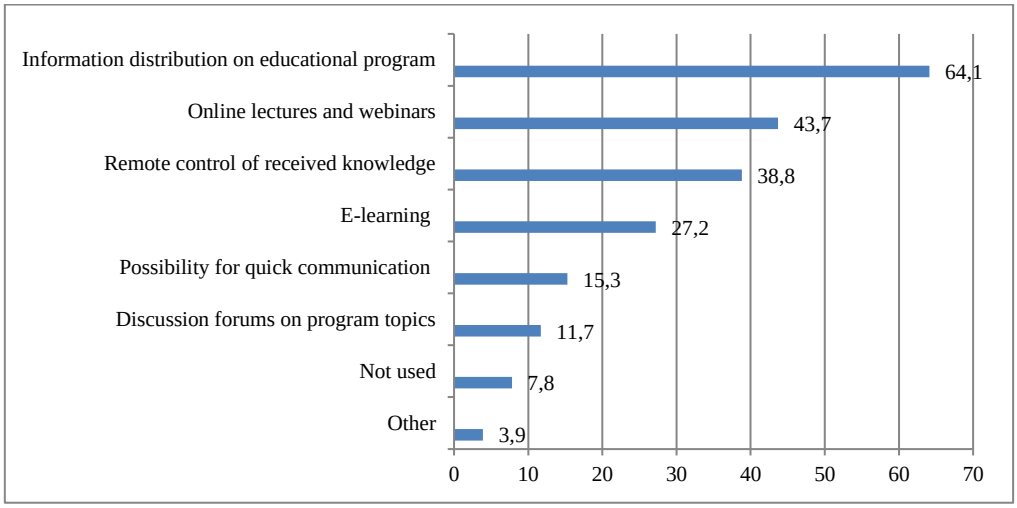

Figure 01. The use of the Internet during the implementation of APE programs (in % of the number of respondents; n = 103)

The survey carried out by the authors allowed to determine that the most important organizational conditions for trainings based on CPE programs are the opportunity to study remotely and information support of the educational process (availability of computers, the Internet) (Table 01).

Table 01. Distribution of respondents' answers to the following question: Which of the listed organizational conditions of training under CPE program are of most importance to you?" (in % of the number of respondents; n = 900)

Organizational condition	**Distribution of answers**
Opportunity to study remotely	33.4
Material and technical support in the process of education (classrooms, laboratories, workshops, equipment, tools, etc.)	31.9
Information support in the process of education (availability of computers, the Internet)	26.8
Training schedule	26.0
Location of the organization implementing the educational program	20.8
Educational and methodological support in the process of education (textbooks, reference materials, guidelines and other literature)	12.4
Number of students in the group	10.4
Other	1.6

Opportunities provided by modern information and communication technologies lead to a smooth transition of CPE system from traditional full-time education to distance learning and e-learning. Full-time distance learning and distance learning are considered the most suitable forms of training under CPE programs according to the majority of respondents (Table 02). Such distribution of answers is quite logical, since, on the one hand, with the rapid development of information and communication infrastructure, distance learning is becoming increasingly popular, and on the other hand, distance learning allows employees to master new professional competences without being detached from the production process, which, of course, from the employer's point of view is a significant advantage. In addition, distance

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technologies make it possible to study at the time convenient for student, to communicate with teachers and other students, to have free access to educational materials (Bugakov, Tsarkov, & Medvedev, 2016).

Table 02. Distribution of the respondents' answers to the following question: What form of training under APE programs do you think is optimal?" (in % of the number of respondents)

Options	**Respondents**	
	Employers, n = 157	***Trainees of AEP, n = 900***
Full-time	13.4	16.5
Part-time	17.2	13.8
In-person and remote classes	10.8	10.7
Distance learning	24.8	24
Full-time distance learning	33.8	35

Distance learning, also called "independent" education, should be based on the innovative methods and forms of education using information and telecommunication technologies and take into account both psychological and pedagogical aspects of training. The main element of distance learning is an e-training (ET), which is a structured, thematically completed educational material with a high degree of interactivity designed for self-study of students through the Internet or through the use of the electronic media. The ET should imply the following: learning material, video content, navigation, knowledge control and self-control. In order to improve the efficiency of distance learning, to provide better understanding and retention of educational material by students, the ET has to meet the following requirements: educational information (text, diagrams, digital materials, video material, audio materials, etc.) must be consistent with learning outcomes and must not distract the user's attention; the ET interface should be visual and unambiguous; besides, it should promote convenient media for fruitful learning; the ET navigation should be understandable and should match with the intended completeness and consistency of material.

To continuing our study about the role of ICT in the CPE system, let us turn to the experience of implementing innovative educational programs of CPE at BSTU named after V.G. Shukhov. From 2010 to 2018 in order to develop human resources for organizations and enterprises (nanotechnology developers and users) of the Russian Federation, more than 10 advanced educational programs were developed and implemented by the order of the companies employed in nanoindustry with the support of the Fund for Infrastructure and Educational Programs (FIEP). A distinctive feature of these educational programs was the obligatory availability of ET (a module in a distance format).

In 2010, the information and education portal nanoopen.ru was created, i.e. a computer system (server aggregate or multiservice server) the main purpose of which is the provision of quick access to the educational resources, provision of educational services by relevant institutions and organizations in the telecommunications network. In order to ensure the possibility of distance learning and self-study through e-learning on this educational portal, the promotional websites of the above-mentioned educational programs of CPE were created.

The system developed by specialists of BSTU named after V.G. Shukhov fully complies with all generally accepted criteria and requirements for modern information resource. It has the function that allows working with ET and serves to improve the convenience and speed of the learning process.

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The program complex was created on the basis of key principles of innovative concept of the development of distance learning. In the course of development the following was taken into account: time of distance learning process, innovative component of the scientific field, as well as continuous form of the educational process.

For better understanding and digestion of theoretical material, the educational programs distributed on the websites are accompanied by a large number of visual diagrams, drawings and videos. During the entire period of distance learning, the coordinators of academic disciplines provide listeners with off-line and on-line consultative support on the issues of educational material being studied, which can significantly improve the efficiency of the learning process. Upon finishing studying the material of the remote module, in order to self-control knowledge, students are invited for a test. To advance practical skills, specialized training simulators and virtual simulators were developed.

To test students' knowledge, both classic assessment tools (various forms of testing) and visual and graphic simulators, which allow not only to test students' knowledge, but also to initiate better memorability of the educational material were used.

The developed mechanism can be also used to test highly specialized groups of students. As the visual and graphic simulators are user-friendly, it is possible to use them for employees retraining and development. Another feature of visual and graphic simulators is the possibility of using them to convey the unique sales offer on market to the target audience.

The educational material presented on the information and educational portal meets modern requirements of a mass audience. An important feature of the developed ET is an access provision from various devices (mobile phones, tablets, laptops and desktops) and appropriate (correct) presentation of all educational materials on these devices. This allows to significantly speed up the educational process, improve its quality due to the higher involvement of students, and also allows students to independently plan their educational process for the distance module and realize the need to re-study and consolidate the material that was completed during their full-time studies. The autonomous cross-platform shell developed for the purpose of portable use ensures the relevance of educational materials during the period of extensive use of the existing Internet technologies.

Having regard to the above said, one may assume that one of the promising areas of informatization of CPE in the Russian region is the development and improvement of educational portals of continuing professional education. This will allow to implement an integrated approach to the introduction of information and communication technologies into CPE system, change the quality of the process of education (Bakach, Saigushkina, & Shutko, 2018), provide new opportunities for its further development, promptly disseminate new information about ongoing development courses and professional training programs, improve the management system of the educational institution and functioning of its entire infrastructure, and carry out remote training of students and self-education of employees from various industries.

It is worth mentioning that the overwhelming majority of students (over 80%) who have been trained on the basis of CPE educational program Development and Production of Nano-Modifying Additives for Composite Materials for Construction Purposes, developed and implemented at BSTU named after V.G. Shukhov in 2016–2017, indicated that it was much more convenient to learn the material remotely in e-

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format. This is quite logical, since most students in the system of vocational education are, as a rule, working citizens, and training in a distance mode allows them to do on-job training and adjust the learning process to their own needs.

Distance learning is very popular in Europe and the United States. It has a number of advantages, among which are as follows: the availability of training for the majority of social groups; possibility of choosing a place (educational institution) and duration of study (Parakhina, 2013); possibility of parallel education in different educational institutions; possibility of combining training and work or accelerated education; continuity of the learning process; relevance of the content of the educational programs due to the possibility of its rapid updating with help of communication and computer technologies.

However, it is worth noting that only 19.4% of the surveyed students of CPE programs answered that their training is carried out using distance learning technologies (Table 03). Thus, when there is currently a large number of innovative educational technologies in the educational practice of vocational education in the region, as can be seen from Table 3, standard technologies are mainly used, such as lectures, practical exercises, work with visual aids, audio and video materials, and seminars. This situation may be due to the problem of insufficient readiness and ability of teachers to use information and communication technologies in their professional activities (Shafranova, 2018).

Basically, a university teacher is focused on students and stable educational programs. Meanwhile, the target audience of CPE are specialists who already have a degree in the field of higher or secondary vocational education, who are interested in obtaining information directly related to the solution of problems related to their professional activities. It is not a rare case when a university teacher, even having a degree and a title, does not have necessary level of competence to give answers to practical questions. In this regard, one of the important qualities of teachers in CPE system is practical experience in a particular industry. In addition, in the age of global computerization and informatization, teachers of the educational programs for advanced training and professional retraining should have specific knowledge in the information technology culture, which implies the following: the ability to use ICT in professional activities; the ability to select sources of information and search for new data; the ability to use methods of analytical processing of information; knowledge of ethical standards of behavior in the information networks; the ability to use hardware and software of telecommunication technologies; the ability to organize and conduct training sessions, webinars, thematic newsgroups, etc. using modern educational technologies, including the remote ones (Tarnaeva, 2011).

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Table 03. The most common educational methods and technologies used in CPE programs (in% of the number of respondents; n = 900)

Educational technology	Answer distribution
Lectures	60.8
Training sessions	53.9
Visual support: textbooks, audio and video materials	47.0
Seminars	44.3
E-learning	19.4
Master classes	14.0
Virtual laboratories, simulators, computer simulators	12.7
Trainings	12.6
Case-studies	10.7
Brainstorming	9.3
Discussions (group discussions)	7.7
Business games	5.9
Basket method	4.7
Behavior modelling	3.8
Role plays	3.1
Other	2.9

Note. The question assumed a multiple answers; therefore, the total amount of answers exceeds 100%.

Today, the pace of development of new technologies is way ahead of the pace of professional development of a person, which leads to professional incompetence and functional illiteracy of workers (Korytov, 2007). The problem of national education lagging behind modern realities is aggravated and its social significance is devalued. All this leads, on the one hand, to a lack of qualified personnel in the enterprises, and on the other hand, to unemployment among university graduates and young specialists (Dadaeva & Fadeeva, 2014). Therefore, an increasingly urgent task is to overcome the situation when the educational process in the system of CPE is built on the same principle as teaching students in the framework of basic educational programs of higher education, which are not always possible to update quickly and efficiently taking into account the demands of the information society, as well as ongoing changes in science and technology. As CPE is a system which is more flexible and mobile compared to the system of higher education, it is designed to solve the problem of training graduates, as well as training or retraining of workers, taking into account the strategic needs of the labor market. Thus, we can conclude that CPE is designed to provide advanced education, the informatization of which involves the development of electronic teaching materials, the development of a single open information and educational space, the introduction of a remote monitoring system of CPE, and an increase in citizens' motivation for self-development, as well as development of professional competence and culture.

Despite the obvious positive aspects of penetration of information and communication technologies into the system of CPE, it should be noted that the technologization and informatization of the educational process can lead to the training of specialists with insufficient values. The widespread use of ICT leads to a slowdown in the development of a creative person, degradation of thinking, which is transformed from a reflective thinking into a standard one, based on the principle of easy and fast obtaining of information as a finished result. All of this provokes a massification of tastes, interests, and aspirations leading to the "loss of an individuality".

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Another modern trend in the educational process of CPE is a Smart concept, entailing the emergence of a new style of intellectual creativity, the emergence of new forms and genres of information objects. A wide distribution of distance learning and e-learning has been a prerequisite for the emergence of Smart education, which implies an amalgamation of faculty and educational organizations for joint implementation of educational activities in an interactive information and educational environment using Internet content from around the world. The main condition for the transition to smart learning is to focus not on books, but on the Internet resources. Smart education is based on the idea of individual education and its accessibility at any time and in any place (Tikhomirov, 2011).

7. Conclusion

To sum up, it is necessary to highlight the following facts. The ongoing process of global informatization is dynamically transforming the entire social reality. One of the modern trends is the informatization of education, which is connected, first of all, with the introduction of modern information and communication technologies into the educational process. These trends are the effective tool for improving the quality of the educational process. The sociological analysis of CPE allows us to conclude that the main trends in the development of informatization of CPE system are the active use of distance learning in the educational process and the introduction of innovative educational technologies. At the same time, the effective application of the information technologies in CPE is determined by creation of certain psychological and pedagogical conditions: 1) provision of information educational environment comfortable for learning; 2) development of students' ability to navigate information flows, find and arrange different information, as well as work in the information environment; 3) an account for individual features of students in the process of organizing distance learning. Thus, among social conditions for a successful development of informatization of CPE there should be a high level of education of the population, motivation of citizens for the development and widespread use of innovative technologies, improvement of living standards and welfare of citizens.

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