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ENHANCING THE COMPETITIVENESS OF COLLEGE GRADUATES THROUGH THE DIGITAL EDUCATIONAL ENVIRONMENT

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Abstract

Almost all ongoing reforms and transformations that take place in the sphere of the secondary vocational education system in one way or another happen due to the necessity to improve the training of a future specialist - a competitive graduate of a professional educational organization, who is able to meet the requirements of the labor market and employers, and therefore participate in social economic development of the country. To create a competitive specialist it is necessary to use the potential of the digital educational environment of a professional educational organization, since such educational bodies have a special mission – to prepare a graduate with the necessary set of professional and extraprofessional skills. Such specialist should be ready to continue education in a high-tech information society because they know how to form new necessary competencies, able to grow their new professional skills and qualities in changing conditions of professional activity, and know how to take an advantage of a digital educational environment. In the course of a theoretical analysis of scientific and pedagogical literature and positive pedagogical experience we analyzed the essence and structure of competitiveness and the digital educational environment, necessary for conducting diagnostic procedures and confirming the correctness of the hypothesis. The article substantiates the pedagogical conditions for increasing the graduate's competitiveness by means of the digital educational environment: the interaction of subjects of educational relations is mediated by high-tech means of informatization that meet the modern needs of the training system for future specialists.

1. Introduction

Such an integral characteristic of a graduate as competitiveness lies in the sphere of the main interests of the modern educational and social policy of the government. Today, the labor market and the socio-economic situation dictate strict requirements for the training of young professionals in relation to the quality of their professional activities. In this regard, the priority task of any professional educational organization is to train a competitive specialist who, in addition to a set of general and professional competencies, has the competence to form new competencies that which are the base in developing the competitiveness. Forming the specialist's competitiveness is the subject of research in many fields of science, however, the issues of improving the studied quality of a specialist by means of a digital educational environment are not well understood. Most studies describe the processes of formation and development of professionalism, personal self-efficacy. However, it should be noted that these concepts are not identical. The level of competitiveness of a specialist is determined by the level of professionalism, which in turn depends on the self-efficacy of the individual.

An analysis of the requirements made by employers (Kirshin, 2015) unambiguously reveals the characteristics that allow graduates to compete for the workplace.

In the market of educational services, there is a competition between educational institutions. In the labor market there is a competition among graduates. The higher the competitiveness of an educational institution, the higher it is among graduates/ It happens because the components that make it up include not only the reputation of the educational institution in the academic and student circles, but it also includes the success of the graduates in obtaining jobs after graduation, the employer's level of trust to a diploma, and even the average graduate salary. Not only a graduate should be competitive, but also the educational institution in which he is studying. This competitiveness is provided, among other things, by the openness of the educational system. This means that the definition of educational goals is not limited to the state order, but is expanded in accordance with the educational needs brought by students, their parents, teachers as subjects of educational relations, programs set the basis, i.e. the necessary minimum, the general core of knowledge, which is open to additions depending on the cultural, regional, ethnic and other educational conditions and the individual needs of the individual students.

A significant place in creating an open educational environment belongs to the digital educational environment. The digital educational environment – as a integrated communication space for all participants in educational relations, an effective tool for managing the quality of the implementation of educational programs and the work of the teaching staff – involves a set of ICT tools, the use of which is systemic in nature and will satisfy the requirements of the Federal State Educational Standard, helps students achieve the planned results of professional training.

Studying the experience of forming a college graduate's competitiveness by means of a digital educational environment made it possible to highlight the contradictions between:

- the increased demands made by society on the quality of training of college graduates, and the insufficient development of theoretical and practical foundations for using the digital educational environment in secondary vocational education institutions to ensure the compliance with these requirements;

- awareness of the teaching and management staff of professional educational organizations of the need to modernize the educational process based on the digital educational environment and the insufficiently developed pedagogical conditions for increasing the graduate's competitiveness by means of the digital educational environment.

2. Problem Statement

The problem of assessing the competitiveness of graduates in the labor market is considered in the works of Salnikova, the features of the creation and implementation of the quality management system of vocational education are revealed in the works by Trukhanovsky and Tabatadze (Salnikova, 2012; Truhanovskiy & Tabatadze, 2010, p. 16). In scientific publications, the special attention is paid to the problems of increasing the graduate's competitiveness in the educational environment (Konoplyanskiy, 2016; Vezirov, 2016).

Aspects of using informational media in training, building a generally accessible medium for the provision of electronic educational services are considered in the works of Bershadsky and Bozhday (2017). The requirements for material and technical equipment, for the level of training of teachers for the use of distance educational technologies and e-learning in the educational process are presented in the works of Ponomareva (2018), criteria for the effectiveness of forming a digital educational environment in systems of general, professional and additional education are disclosed in the work of Karakozov (2018). The implementation of e-learning, taking into account the specifics of the digital educational environment, gets some special attention in the works of scientists (Afanaseva & Zyablov, 2018; Barahsanova & Danilova, 2018; Kulikov, 2016).

A study of the scientific literature shows that the authors differently assess the importance of the digital educational environment for the formation of a competitive specialist, there are differences in understanding the essence and structure of the digital educational environment and the competitiveness of a college graduate.

The impact of the digital educational environment on the competitiveness of college graduates remains poorly covered in the literature but it still is of particular interest.

Thus, the research problem is to determine the pedagogical conditions for increasing the graduate's competitiveness by means of the digital educational environment

3. Research Questions

After analyzing the process of the future specialists professional training we were able to formulate the subject of our research: pedagogical conditions for increasing the graduate's competitiveness by means of a digital educational environment (DEE):

Interaction of subjects of educational relations is mediated by high-tech means of informatization that meet the modern needs of the training system for future specialists;

DEE is saturated with electronic resources with the ability to build an individual educational trajectory in accordance with the needs of students, which provides high motivation for educational and professional activities of students

DEE is the integration basis of the educational process in college and the student's educational and professional activities at work, which entails further intersubject integration.

4.   Purpose of the Study

The purpose of work is on the basis of theoretical analysis and positive pedagogical experience to identify and justify the pedagogical conditions for increasing the competitiveness of a college graduate using digital educational environment.

5.   Research Methods

The research contains the following steps.

• Analytical, involving clarification of the nature, structure of DEE and competitiveness, as well as the criteria and methods for their assessment. The leading method is a theoretical analysis of literature and teaching practice.

• Diagnostic, involving a stating experiment and analysis of its results. The leading methods are sociological, pedagogical testing, analysis of the products of students' activities and their employment.

• Designing, providing for the justification of pedagogical conditions for increasing the competitiveness of a college graduate by means of a digital educational environment, development of a program for implementing the educational process in an experimental mode. The leading method is design.

• Experimental, involving the practical implementation of the program for the implementation of the educational process in an experimental mode and an analysis of its results. The leading method is a pedagogical experiment, analysis.

At the first stage, considering the competitiveness of a graduate of a professional educational organization as its integral characteristic, which is a combination of personality traits that determine its ability to carry out certain activities more effectively than others, distinguishing it from other participants in the competition, it is necessary to take into account the formation environment of these qualities.

Traditionally, the competitiveness of a young specialist is usually understood as "an indicator of the quality of training and the ability to realize the professional and personal qualities of a graduate of an educational institution in the interests of modern production (organization)" (Batyishev & Novikov, 2009).

Various researchers consider the concept of "specialist competitiveness" as an integral characteristic of the personality of a specialist, expressed in the totality of personal, professional and polyprofessional qualities that determine the success of professional activities in organizing professional activities in the context of the requirements and requests of employers and the labor market (Bahtiyarova, Oruzbaeva, & Zaytunova, 2017; Vakhidova, Gabitova, & Ivanov, 2018)

Analyzing the qualities in question, we single out the main components of a specialist competitive in the labor market: motivational, informative, and evaluative (Table 01).

Table 01. Graduate Competitiveness Diagnostic Tools

Component	Indicator	Assessment Methodology
Value-motivational	professional activity motivation level; motivation level for educational activities; development of cognitive needs; attitude to future professional activity as a personal and social value; level of the desire to achieve success; prevalence of the motive for achieving success over the motive for avoiding failure. level of the value characteristics in demand in the profession level of social and professional activity, active life position desire for independent activity, determining the success of competitive behavior	Methodology for studying the value orientations of M. Rokich, questionnaires, oral interviews, observation, interviewing, the method of unfinished sentences, test "Self-esteem of personality" S. Budassi
Content and technological	volume and quality of knowledge, skills and their compliance with the requirements of the Federal State Educational Standard of Higher Education and the professional standard of a specialist; number of related industries in which the graduate can work without significant time and effort to learn new specialties; ability to learn throughout the whole life, ability to solve professional problems at the level of innovation and creativity; ability to use modern information and communication tools in professional activities; proficiency in constructive professional and interpersonal communication. level of professionally significant personal qualities	test "Sociability" to identify the ability to get on well with people by Yu. Orlov, test by E. Passov and test by A. Barshev to determine the degree of development of students' communicative abilities and skills, tests "Ability to Listen", "Level of possession of non-verbal components in the process of communication" by G. Shelamova, observing the behavior in game situations, real situations
Reflective Assessment	ability to design your professional development; ability to self-regulate behavior and activities; awareness of yourself as a subject of educational and professional activities	practical tasks, pedagogical observation, essays

The level of these components of competitiveness allows college graduates to get a job in their specialty, to work in their field of training for more than three years.

In preparing a competitive specialist, one of the leading positions, according to scientists, researchers and educators, belongs to the digital educational environment (DEE) of the educational body.

The educational effect of the educational center is that, as a system integrator of the entire pedagogical process, it provides qualitatively new parameters for education. The most accurate systemic nature of DEE is reflected in the understanding of this concept, legally enshrined in the FSES. This is a system of information and educational resources and tools that provide conditions for the implementation of the main educational program of an educational institution. Researchers distinguish the following components of the digital educational environment: program-strategic, organizational-managerial, educational-methodical, resource-informational (Saveleva, 2003, p. 122). The classification of the components of the digital educational environment, proposed by Vlasenko and Yakushina (2012, p. 125) is close here: they speak about hardware, resource, personnel, regulation, methodology, technology. Teachers from Holland distinguish four main components of the information and educational environment – a vision of the school's future image, teacher qualifications in the field of ICT application, educational and methodical complex, and ICT infrastructure.

The digital educational environment, being a complex of digital educational resources, is a combination of technological means of information and communication technologies: computers, other ICT equipment, communication channels, a system of modern pedagogical technologies and digital educational resources that provide professional training.

The DEE of an educational organization should provide the solution of the following tasks: information and methodological support of the educational process, planning of the educational process and its resource support, monitoring and recording the course and results of the educational process, modern procedures for creating, searching, collecting, analyzing, processing, storing and presenting information, remote interaction of all subjects of the educational process, educational institutions with other organizations of the social sphere.

DEE allows the administration of the educational body to effectively manage the institution using modern digital tools, modern financing mechanisms, create information and library centers with work areas equipped with reading rooms and book depositories, provide access to them and information resources of the Internet, educational and fiction books of electronic library systems collections of media resources on electronic media; x and methodological text-graphic and audio-video materials.

DEE gives teachers the opportunity to track and adjust the educational process, fixing its dynamics, intermediate and final results, design and implement the organization of individual and group activities, and the organization of students' independent work using ICT.

Placing in the DEE the products of cognitive, educational, research, design and creative activities of students allows them to increase their motivation. The development and use of our own electronic educational resources for organizing training using distance educational technologies allows us to free up class time for working out practical skills in contact work. In methodological activities, it is possible to conduct webinars, consultations, master classes for students and colleagues.

DEE provides students with the opportunity to build an individual educational route in accordance with their own needs and capabilities, determining the pace, depth and methods of mastering educational material, ways of recording learning outcomes, and the choice of additional education programs (Table 02).

Table 02. Components and indicators of the digital educational environment in a professional educational organization

DEE component	Indicator	Indicator criteria
computers and ICT equipment, communication channels	matching the number of computers to the students under the training course Internet speed local network	matches meets the needs yes / no
system of modern pedagogical technologies	workstation of the head, teacher workstation, student workstation blended learning content for the distance learning system connection of the educational process with the professional activities at work	yes / no yes / no yes / no yes / no % of the total number of courses in the distance learning system yes / no
digital educational resources	number of own resources created the quality of their own created resources, subscription to electronic libraries, the amount of mass open online resources used in the educational process.	share in relation to the total number of disciplines in the distance learning system low / medium / high number number

The second stage is a diagnostic one. It involved conducting a stating experiment and an analysis of its results. The reason for such a low formation of the value-motivational component, in our opinion, is the insufficient formation of the DEE components. There is a dissonance between life in a high-tech society, on the one hand, and the traditional education system which lacks DEE, on the other hand. The solution to this problem is seen in active using the DEE components and tools in the process of future specialists training.

Having been formed, these components of competitiveness allow college graduates to get a job in their specialty, (the average for the region is 65%, in the surveyed college – 63%), to work in their working field for more than three years.

The analysis of the college DEE showed that the existing level of computers, ICT equipment and communication channels is at its minimum. They are used primarily to demonstrate educational material in classes conducted in a traditional format without using information and educational resources. In some professional educational organizations, the automated workplaces of the head, teacher or student are not equipped, there is no high-quality content for the distance learning system, there are no digital resources

created by the students themselves, students do not use massive open online resources in the educational process, and there is no subscription to electronic libraries.

During the designing stage we justified the pedagogical conditions for increasing the competitiveness of a college graduate by means of a digital educational environment. Then we developed a program for the implementation of the educational process in an experimental mode.

The first pedagogical condition is the interaction of the subjects of educational relations mediated by high-tech means of informatization that meet the modern needs of the training system for future specialists.

The most popular means of informatization to support pedagogical activities include multimedia and interactive technologies for modeling and predicting the processes under study, conducting research under conditions of computer simulation of real experience, the possibility of social media for collective discussion of various issues and for collaboration, the use of game techniques and heuristic methods in training, gamification of the educational and research process using approaches and methods peculiar to computer games, applied taking into account the specifics of game thinking in a non-game space, mLearning and mScience approaches that allow using wireless mobile applications and interfaces as well as implementing more free forms of learning and independent work. The means of informatization are presented with such requirements as functionality, user friendliness, adaptability, mobility, reliability, the ability to interact with the user.

One of the significant conditions is the high motivation of the students in educational and professional activities which appear due to the rich digital educational environment provided by electronic resources with the ability to build an individual educational trajectory in accordance with the students' needs.

Motivation for learning is a set of factors that determine the student's motivational tendency, which, depending on his or her educational intentions and external reasons, can activate or inhibit his learning activities. The main task of the teacher is to develop the desire for success, encouraging achievements, without focusing on failures.

The general way of forming educational motivation is to help in transforming the broad motivations of students into a mature motivational sphere with a stable structure and the dominance of individual motives. Particular opportunities are provided by the digital educational environment, saturated with informational educational resources and allowing not only to make responsible development path choices, but also to develop students' independence and self-control in educational activities. The educational motivation is stimulated by the use of visual, didactic and technical teaching aids, prompt feedback, especially with the use of the internal network, college website, teacher website, social networks, instant messengers and gadgets.

The integration of the educational process in college and the student's educational and professional activities in the production environment in a digital educational environment contributes to the actualization of intersubject communications in vocational training, which plays an important role in improving practical and scientific-theoretical training of students. Thus, with the help of multilateral intersubject communications, we lay the foundation for a comprehensive vision, approach and solution of complex problems of reality.

When during the theoretical training the teacher demonstrates the elements of real production processes with the help of remote access technologies it allows the teacher to connect training with life and production, which not only increases the level of motivation of students for educational and professional activities, but also strengthens interdisciplinary integration.

If during general courses teachers selects materials used in the special disciplines and industrial training, if they saturate lessons with tasks, examples, problematic issues and situations of a production nature it all helps to educate students in a value-based attitude to their profession.

6. Findings

The implementation of the identified pedagogical conditions in the experimental educational process of the college led to the renewal of the computers and ICT equipment, a local network was created, a high-speed Internet was connected, systems for automating the educational process of the college were acquired, workplaces were equipped for students to work independently when doing independent work, in preparation for course and diploma design. The college organized the connection to electronic library systems. The teachers have been trained and are implementing various models of blended learning technology; they as well developed the educational content for the distance learning system. This has led to a change in the graduate competitiveness profile (Figure 01).
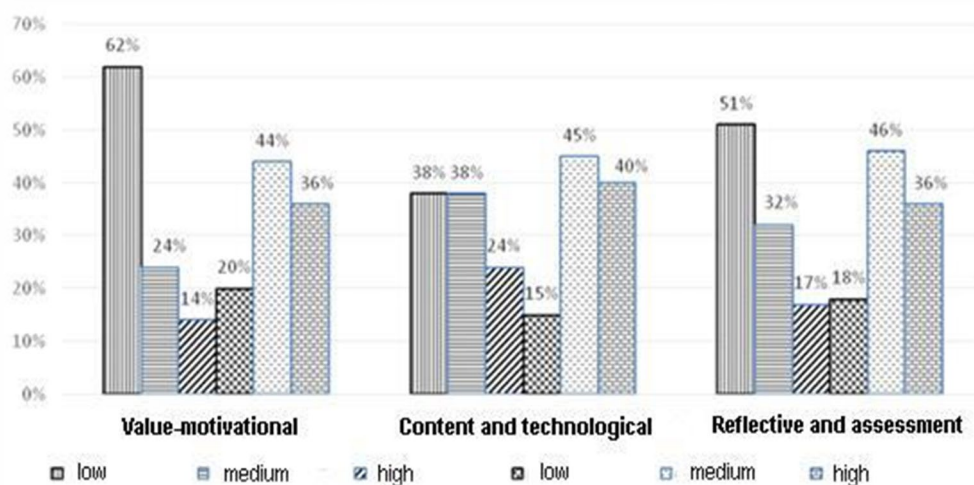
Figure 01. Comparative chart "The results of the stating and control experiments"

In accordance with the components of student competitiveness that we examined, we could identify the general level of development of each component in particular, based on the average score. In expanded form, to determine the level of development of a particular component of student competitiveness, we calculated the average score as follows

$$K = \frac{X1 + X2 + \dots + Xi}{n}, \text{where}$$

Xi is the point corresponding to the level of criterion development;

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i is the diagnostic technique used to assess the level of criterion development;

p is the number of diagnostic methods used to assess the level of development of a particular criterion.

The generalized result for each level of development of student competitiveness components was determined using the methodology of Kyiveryalg (1980), according to which the average level is determined by 25% deviation of the estimate from the average for the range of estimates, then an estimate from the interval from R (min) to 0.25 R (max) allows us to state a low level. Estimates exceeding 75% of the maximum possible indicate the high level. Since the range of grades that students could receive for each component ranges from 1.0 to 3.0, the mechanism for correlating the average score with the level of development of each component of student competitiveness will be as follows in Table 03:

Table 03. A generalized result for each level of development of student competitiveness components

Percentage of estimates within the interval Rmin – Rmax	0,0% -25,0%	25,1% -75,0%	75,1% - 100,0%
Points	1.0-1.5	1.6-2.4	2.5-3.0
Level	Low	Medium	High

A variety of experimental data obtained using a set of techniques, gave us a task of selecting the appropriate statistical methods for processing the results, allowing comprehensive analysis of the information received.

The data of personality characteristics obtained during the study were processed on an IBM-PC computer using the STATISTICA for Windows software system (version 5.5a). This system is an integrated environment for statistical analysis and data processing. It carries out all calculations according to standard formulas of mathematical statistics, using only existing, measured data (all gaps are excluded from the calculations and are not taken into account when drawing conclusions). STATISTICA (Borovikov & Borovikov, 1997) allows you to perform all the classical types of analysis on an extremely wide selection of specific algorithms and methods.

As a result of the formative impact in the students' personality, significant changes have been occurred in such components of the substantial characteristics of competitiveness as: motivational-value, substantive-technological and reflective-evaluative.

Therefore, we can conclude that the changes that occurred in the levels of development of competitiveness among students are not caused by random reasons, but are the result of the integrated implementation of the pedagogical conditions that we have identified. This confirms our hypothesis and proves the reliability of the results.

Based on the analysis of the control experiment data obtained by using the same set of diagnostic techniques in the experimental and control groups, as well as statistical data processing, a tendency to increase the level of formation of student competitiveness components was recorded, which indicates the adequacy of the pedagogical conditions implemented in the experimental group.

7.   Conclusion

In the course of a theoretical analysis of the psychological and pedagogical literature on the issue of increasing the graduate's competitiveness by means of the digital educational environment, it was found that specially created pedagogical conditions created ensure the development of competitiveness in the unity of value-motivational, substantive-technological and reflective-evaluative components. The designed educational process in experimental mode has shown its effectiveness, as evidenced by a comparison of the results of ascertaining and control diagnostic sections.

To obtain objective information about the effectiveness of the identified pedagogical conditions, indicators of the manifestation of competitiveness and methods for assessing them are determined.

Thus, the results of our study give reason to make a generalized conclusion that the tasks set in the study are solved, the goal is achieved.

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