DEVELOPMENT OF INFORMATION COMPETENCE OF STUDENTS BY MEANS OF NETWORK AND MULTIMEDIA TECHNOLOGIES

Dina A. Semenova[1*] **and Vera I. Toktarova**[2]

[1]Senior Lecturer, Mari State University, Russia, dinasemenova@gmail.com
[2]Assoc. Prof., PhD, Mari State University, Russia, toktarova@yandex.ru

Abstract

The relevance of the study resulted from great changes in the legislative framework of the educational system and, as a consequence, from the intensive introduction of the competence approach into the educational process of higher education. The article deals with the issues related to the development of information competence of students of higher educational institutions. The main role of competencies and competence approach in professional training of students is regarded; the importance of information competence for the becoming a competitively capable graduate of the university is highlighted. The possibilities of using network and multimedia technologies for teaching students are described. The principles and methods of implementing the competence approach and the development of information competence using network and multimedia technologies are indicated.

Keywords: information competence, Federal State Educational Standards of Higher Education, network technologies, multimedia technologies, educational process, higher educational institution, student

1. INTRODUCTION

The global updating processes within the education system have led to the modernization of educational standards and the use of new forms of organization of the educational process.

Federal State Educational Standards of higher education (FSES of HE) are aimed to correlate the quality of training of professionals with the social demand of the labor market. The first place of such a demand takes place the requirement for the preparation of a competent expert in their professional work, who are able to adapt to changes in the production process quickly.

The model of the graduate implemented by the FSES of HE is based on the competence approach, which involves not only the development of professional competencies, but also the implementation of personal qualities of the future specialist.

We are of the view that competence is the ability of an individual to apply the acquired knowledge, skills and personal qualities for successful professional activity.

In accordance with the Federal State Educational Standards of Higher Education, as a result of the development of the bachelor's degree program, the graduate should have the following competencies:

    − general cultural competencies (GCC) – the ability to act successfully on the basis of practical experience, skills and knowledge in solving problems, regardless of the chosen professional sphere (Khutorskoy, 2003);

    − general professional competencies (GPC) – the ability to face the challenges, typical for specialists of all jobs, due to the general profile of directions of student training, which are systematic and multidisciplinary in nature;

    − professional competencies – (PC) - the ability to act successfully in concrete situations of professional activity, to solve tasks on the basis of practical experience, skills and knowledge (Baidenko, 2004).

Attention is particularly drawn to the fact that the methods of training should correspond to the trends of the present time. Nowadays the use of network and multimedia technologies in the educational process has become not a luxury or a tribute to the time, but a necessity aimed at the implementation of educational tasks of the modern learning process. As a result, the student must be able to work with these technologies, so he needs to have information competence.

2. INFORMATION COMPETENCE IN THE PROFESSIONAL TRAINING OF STUDENTS

2.1. The Definition of Information Competence

Speaking about information competence we mean the ability and skill of an individual to search independently and productively, analyze, process and transmit the necessary information using information and communication technologies.

Like any object, information competence has its structural composition. This issue is reflected in the works of V. Bondar, A. N. Zavyalov, E. F. Morkovin, A. L. Semenov, A. A. Temirbekova and the others.

We have analyzed the FSES of HE in different areas of bachelor training if they include the competencies formed by means of Informatics and information and communication technologies. So we can talk about their presence in any direction of training among general professional and professional competencies, and in some areas of training they can be found among general cultural competencies.

It is the presence of competencies formed by means of Informatics and information and communication technologies in any field of training that allows us to consider information competence as a cluster of competencies formed by means of Informatics and information and communication technologies.

2.2. Multimedia and Network Technologies in the Learning Process

The current stage of development of the world community imposes new high requirements to the training level of specialists of any profile. The purpose and objectives of education are changing, as well as the technologies used in the educational process. Global processes taking place in various fields of human activity, show the development of the information society, in which the determining factor of progressive development is the direction of the use of network and multimedia technologies, playing an important role in the transition of modern society to a competence approach.

According to I. V. Robert, the modification of the providing form of educational material and the structure of educational and methodological support of the educational process determines the structure and composition of the new generation educational and methodological support. Here electronic publications for educational purposes, distributed information resource of local and global networks play the main role. All this implements the above named ICT capabilities. At the same time, the training material in the electronic edition of the educational purpose, distributed information resource of local and global networks is presented in the form of audio-video series based on the implementation of multimedia, hypertext, hypermedia technologies (Robert, 2008). This confirms the fundamental importance of network and multimedia technologies use in the organization of classes.

Multimedia (eng. multimedia from lat. multum - many and media – medium - focus; means) - electronic data storage device, including several of its types (text, image, animation, etc.) (Prokhorov, 2004).

We are of the opinion that multimedia is a technology that allows you to combine text, sound, video, graphics and animation in a computer system.

It follows from the definition that the key components of multimedia are:

    − text is a sequence of sentences, words, constructed according to the rules of the language, the sign system and forming a message (Dictionary, 2018);

- graphics is a type of fine art, including drawing and printed artistic images (engraving, lithography, monotype, etc.), based on the art of drawing, but having their own discriptive means and expressive capabilities (Computer graphics, 2007);

- animation is a technology that allows using inanimate fixed objects to create the illusion of motion (Encyclopedia, 2018);

- sound in general sense is a physical phenomenon perceived by the ear, generated by oscillatory movements of air particles or other environment;

- video is an image recorded on tape, film, photo image or optical disc from which it can be reproduced (Dictionary, 2018).

Educational possibilities of using multimedia technologies in the educational process are:

- availability: students can work with educational resources not only during the classes, but also at any convenient time;

- individualization: through interactive contact with the user, there is an adaptation of the content, methods and pace of academic activities of the student to his peculiarities, which allows the trainee to monitor the expenditure of his forces constantly;

- ubiquity: thanks to the development of computer technologies, you can work with an educational resource not only from a desktop computer, but also from a mobile phone or tablet, which allows you to access it anywhere;

- activation of the learning process: the learner becomes an active and independent participant of the learning process, develops cognitive interest, increases motivation;

- visibility: it is achieved by the use of graphic images, animation and video information in the educational process, which perform an illustrative function, allow to imitate actual processes, contribute to the formation of clear perception of educational information and to the development of creative thinking.

The active development of multimedia technologies and the Internet has not only increased interest in the use of computers in the educational process, but also led to the active development of network technologies in general and distance learning in particular. Network technologies, including a multimedia device and the possibilities of the Internet, means for interactive contact have been successfully established in education as an effective pedagogical tool. The present period of development of the Internet is characterized by the active use of Web 2.0 technologies.

Web 2.0 is a method of systems design, which by taking into account network interactions become better the more people use them (Web, 2018). Services created using these technologies are often referred to as social networking services.

Speaking about network technologies we mean technologies based on the use of computer networks for the organization of the educational process and self-learning of students.

Network technologies make it possible to change fundamentally the attitude to education, the need for continuous improvement of cultural and educational level throughout life.

The educational characteristics of network technologies include accessibility, the ability to organize self-learning, the ability to store and transmit information in different formats, multimedia, the ability to form an individual educational path, increasing the level of student motivation, the development of information and communications and personal competencies.

Among the educational principles of network technologies are the following: the principles of information, communication, visibility; educational principle, the principle of development of students cognitive activity, the principle of implementation of educational technology "learning in cooperation", the principle of development of information culture of students.

2.3. Model of Development of Information Competence of Students by means of Network and Multimedia Technologies

The requirement for the successful development of information competence of students is the introduction of network and multimedia technologies in the educational process, and this requires a clear understanding of the process and its final result, which entails the need to create a model of the organization of the

pedagogical process (Fig. 1).

The main purpose of the model is the development of information competence of students using network and multimedia technologies.

The following tasks contribute to the realization of the goal:

− formation and improvement of skills of work with modern technologies, communicative and social abilities of trainees;

− improving the efficiency of the information competence development process through the use of network and multimedia technologies;

− expanding the possibility of individualization and differentiation of the learning process;

− development of the ability to implement information competence in practice.

FUNCTIONAL DEDICATED BLOCK

Social demand of State and society **+** requirement of FSES of HE ⟹ purpose: development of information competence of students using network and multimedia technologies

INFORMATIVE TECHNOLOGICAL BLOCK

CONTENT: subject content of information technologies field: definitions, theories, methods, algorithms, process

approaches: competent, personal-activity, integrated

principles: individualization and differentiation, self-organization, mobility, modeling of professional activity, continuing education

methods: explanatory and illustrative with the use of multimedia technologies of reproductive learning, problem-search learning with the use of network technologies, interactive learning

means: multimedia technologies (text, graphics, animation, sound, video), network technologies (Internet, social services), technical equipment (computer, projector, interactive whiteboard, speakers, etc)

RESULT CRITERIA BLOCK

result: the well-formed information competence of the student

impact evaluation: qualitative (motivational, cognitive criteria) and quantitative (assessment of knowledge and skills within the content of education)

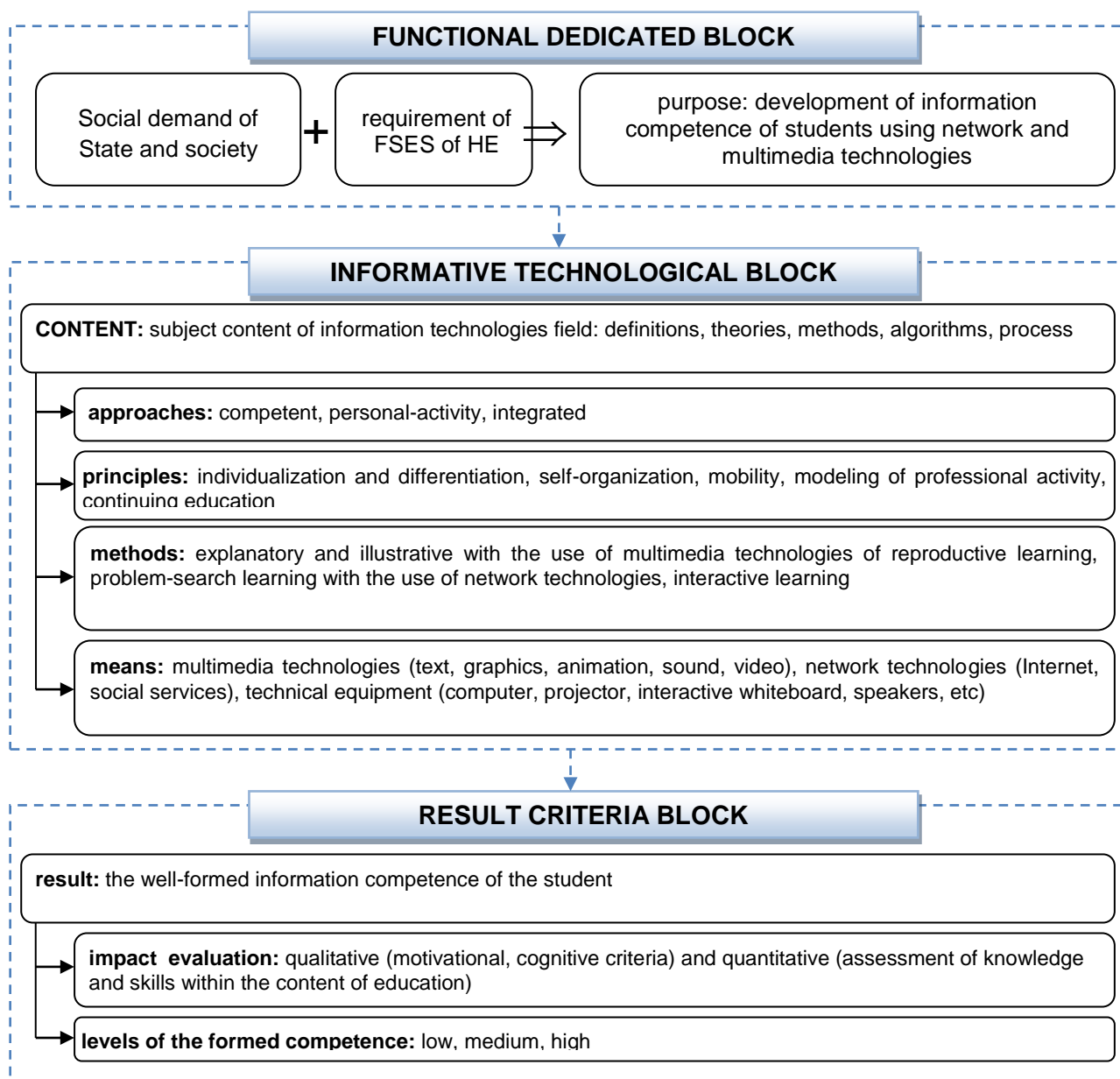**levels of the formed competence:** low, medium, high

Fig. 1. The model of development of information competence of students using network and multimedia technologies

Integration of multimedia and network technologies in the educational process will not only improve the efficiency of the educational process, but also to develop the information competence of students, to carry out self-learning activities, in which the student is self-educated and self-developed.

As part of the experimental work and testing of the model with students of the training direction "Mathematics" and "Applied mathematics and Computer Science" in the 2017-2018 academic year, an increase in the level of information competence was established (table 1).

Table 1. Level of professional competence of students

	competent presentation of professional activity results in digital form	the ability to conduct an effective search for information on the Internet	use of social services in the educational process	creating and editing multimedia information	Purity and simplicity of program code
	max - 100 %				
Entrance level	41,2	56,8	25,1	31,5	11,0
Exit level	92,3	88,1	63,6	79,2	54,3

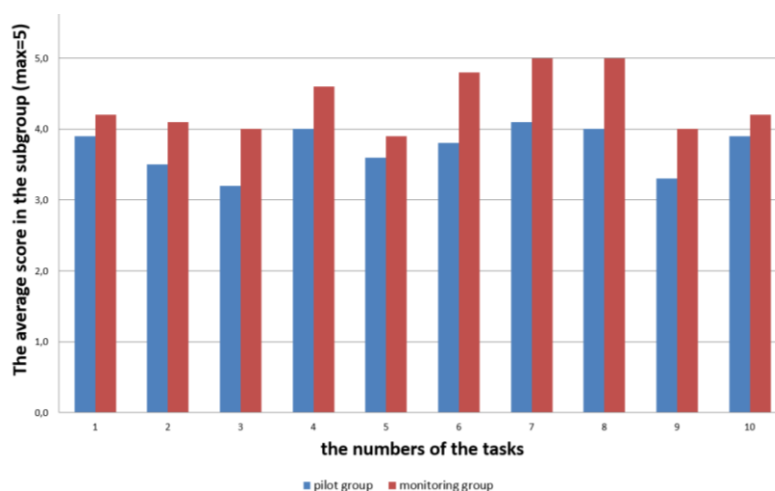The results of the final control work are shown in Figure 2.

Fig. 2. The results of the final control work.

The results of the students' control work, allow us to state the fact that the proposed methods of organization of the educational process with the use of network and multimedia technologies contribute to improving the quality of training of students in the field of information competence.

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