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Development Of teachers' Information Competency In Higher Education Institution[*]

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Abstract. *In modern conditions of continuous development of world technologies and changes in public life, an important component of education is the development of information competency. For successful self-realization in the information-oriented society, the teacher's information competency becomes one of the most important components of professional activity.*

In Elabuga Institute of Kazan (Volga region) Federal University, there is an extensive experience in teacher training. At the same time, the issues of development of information competency of future teachers are of special importance and urgency.

The issues of development of teachers' information competency in higher education institution are considered in the article. They provide for the solving of a large number of tasks, among which the most important is the problem of development of information educational environment and the possibility of its use in professional activity. In this regard, the main stages of development of teachers' information competency in Elabuga Institute of KFU are the following: description of the features of teacher's information competency; revealing the main directions and conditions for the formation of students' skills in the development and active use of e-resources of the educational environment in the educational process, on the basis of modern information communication technologies. The obtained results substantiate the significance and expediency of the conducted research; determine the range of issues for further resolution.

Keywords: higher education institution, future teacher, information and communication technologies, information competency, educational process.

Introduction

The modern stage of society development is characterized by the process of informatization of all spheres of life. This sets the most important goal for the system of higher professional education - the development of a high level information competency of future teachers, who are intended to prepare the younger generation for life and activity in a modern information society, filled with means of storage, processing and transfer of information, on the basis of information technology.

A lot of definitions of the term "information competency" can be found in scientific literature. The analysis of the investigations on the problem of information competency development shows, that in each of them, depending on the field of scientific knowledge and the types of professional activities, the emphasis lays on one aspect or another. Thus, for example,[1] in the issues of information knowledge development are considered in the context of computerization and informatization of education. The problems of forming the

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[1] R. Bednarova, J. Merickova, "Learning and teaching with technology e-learning as a motivation in teaching physics," in *Procedia - Social and Behavioral Sciences*, CXXXI (2012), p. 105-110; B. E. Starichenko, I. N. Semenova, A. V. Slepuhin, "Concerning the Interrelation of E-learning Concepts in Higher Education," in *The Education and Science Journal*, IX (2014), p. 51-68.

"information culture" were discussed in the study.[2] The peculiarities of intensification and activation of training, based on the advantages of modern information technologies, were described in.[3]

The consideration and the analysis of works, devoted to the problem of development of information and communication (ICT) competencies of university graduates shows, that currently there is an important trend, which determines the requirements for the level of ICT competency of the modern teacher, in the form of shifting the emphasis from the tasks of technological level, related to mastering of specific tools, specific software products, to the tasks of pedagogical level, in the form of skills in the application of ICT technologies in the professional activities. In this regard, the ICT competency of teacher should ensure the implementation of new goals of education, innovative forms of organization of the educational process, the relevant content of educational activities.

At the same time, the following three main components of ICT competency are identified:

- sufficiently high level of functional literacy in the field of ICT;

- effective, justified application of ICT in educational activities for solving professional issues;

- the understanding of ICT as the basis of a new paradigm in education, aimed at the development of trainees as subjects of the information society, capable of creating new knowledge, able to operate with arrays of information to obtain a new intellectual and activity results.

Proceeding from the above, it is possible to distinguish two levels of requirements for the teacher's ICT competency-technological and methodological. It is obvious, that the formation of appropriate ICT competencies of future teachers of higher education institution should be carried out by different specialists: technological - from information technology departments, methodical ones - from the departments of pedagogy and methodology, in a specific direction.

In 2011, UNESCO, in partnership with the world leaders in the field of information technology (in particular, Microsoft Corporation) and leading experts in the field of informatization, developed international recommendations, where the requirements for ICT competency of teachers (or academic staff) were presented - UNESCO's ICT Competency Framework for Teachers.[4]

The importance of relevant teachers' information competencies for the successful implementation of educational process in the ICT-intensive educational

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[2] F. Ekici, I. Kara, E. Ekici, "The primary student teachers' views about a blended learning application in a basic physics course," in *The Turkish Online Journal of Distance Education,* XIII (2012), no. 2, p. 291-310.

[3] T. Martin-Blas, A. Serrano-Fernandez, "The role of new technologies in the learning process: Moodle as a teaching tool in physics," in *Computers & Education,* LII (2009), no. 1, p. 35-44; V. Y. Shurygin, L. A. Krasnova, "Electronic learning courses as a means to activate students' independent work in studying physics," in *International Journal of Environmental and Science Education,* XI (2016), no. 8, p. 1743-1751.

[4] Structure of ICT competency of teachers. UNESCO Recommendations.(2011). Retrieved from http://iite.unesco.org/pics/publications/ru/files/3214694.pdf., accessed 12. 06. 2017.

environment of higher education institution is analyzed in the recommendations of UNESCO.[5]

Thus, all the above, emphasizes the importance of searching for new forms and approaches to the development of information competency of future teachers in higher education institution.

Materials and methods

The importance of the problem of development the information competency of future teachers and the further organization of systematic and consistent work on the resolution of certain issues are based on the following important steps.

The stage of the study of self-assessment of teachers' ICT competency was carried out within the framework of the qualification upgrading courses and professional retraining, organized at Elabuga Institute of KFU in 2016-2017. The study involved 345 teachers of secondary schools and teachers of secondary vocational education.

The stage of determining and studying the level of formation of ICT competency of future teachers was carried out as part of the course works on the development of electronic educational resources, and their approbation during the students' pedagogical traineeship.48 students of the final year of the training course "Vocational training, profile: energetics" took part in the study, performing in2016-2017 academic year at Elabuga Institute of KFU.

Results and discussion

The results of self-assessment study of educators' ICT competency show that teachers are increasingly aware of the advantages of using information and communication technologies in the field of education.

So, 79% of respondents systematically apply the available skills of using ICT in a daily and professional context. Only 50% of respondents carry out pedagogical activity in the information environment and constantly display it in the information environment. However, it was found, that the respondents' understanding of the educational process on the basis of ICT is quite heterogeneous. By the organization of educational process on the basis of ICT, respondents mean:

- development and use of the task for students/pupils during the lesson - 28%;
- check of students/pupils tasks - 27%;
- fixing the intermediate and final result - 24%;
- remote consulting - 21%.

Based on the respondents' answers, currently, the following aspects are significant factors in the process of ICT competency formation:
- introduction of new standards - 13%;

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[5] B. E. Starichenko, "Professional standards and ICT-competency of the teacher," in *Pedagogical Education in Russia,* VII (2015), p. 6-15.

- availability of sufficient technological base of educational institutions - 15%;

- availability of broadband Internet channel - 12%;

- constant access to a mobile computer -13%;

- tools of the information environment,implemented in the educational organization - 8%;

- existence the need in teachers to increase ICT competency - 16%;

- establishmentof the administration of educational organization - 5%;

- adoption of local normative acts on the work of collective of the educational organization in the IP - 5%;

- initial mastering by the teacher of basic ICT - competency in the system of professional development - 9%;

- expert assessment of the teacher's activity in the IP of educational organization - 4%.

It should be noted, that most of the teachers consider, that at present a qualitative educational process is inconceivable without the use of information and communication technologies, the main characteristic of which is an increased degree of interactivity, manifested in the use of network computer technologies, activating the educational process.

Interactive forms of education are considered in the researches.[6] In these works, it is emphasized that the use of interactive teaching methods contributes to the organization of educational process, in which the learner becomes a full, active participant in the learning and perception process.

Thus, the development of information competency of teachers is based on the strategy of solving a large number of tasks, among which the task of forming an information educational environment and the possibility of its use in educational activities are particularly significant.

At the same time, electronic educational resources are important elements of the information educational environment. Considering e-learning courses (ELC), it should be noted that, on the one hand, they represent a certain set of information (graphic, text, digital, speech, music, video, photo, etc.). On the other hand, the e-learning course is a software and information component of the educational system, where the users are teachers, students and the administration of the educational institution.

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[6] T. I. Anisimova, L. A. Krasnova, "Interactive Technologies in Electronic Educational Resources," in *International Education Studies,* VIII (2015), no. 2, p. 186-194; Y. V. Gushchin, "Interactive teaching methods in higher education," in *Psychological Journal of International University of Nature,* II (2012), p. 1–18; E. M. Ljubimova, E. Z. Galimullina, R. R. Ibatullin, "The development of university students' self-sufficiency based on interactive technologies by their immersion in the professional activity," in *International Education Studies*, VIII (2015), no. 4, p. 192-199; E. A. Reutova, *The use of active and interactive teaching methods in the educational process,* Novosibirsk, NSAU Publishing House. 2012; M. N. OSamedov, G. S. Aikashev, V. Y. Shurygin, A. V. Deryagin, I. A. Sahabiev, "A study of socialization of children and student-age youth by the express diagnostics methods," in *Biosciences Biotechnology Research Asia,* XII (2015), no. 3, p. 2711-2722; R. N. Shaidullin, L. N. Safiullin, I. R. Gafurov, N. Z. Safiullin, "Blended learning: leading modern educational technologies," in P*rocedia - Social and Behavioral Sciences*, CXXXI (2014), p. 105-110.

In this regard, the issues of preparing future teachers for the development of electronic educational resources, on the basis of modern ICT technologies and the corresponding computer programs, acquire particular urgency.

The innovative features of e-learning courses are the following:

- ensuring the functioning of the components of educational process;
- acquisition of information;
- availability of feedback;
- interactivity;
- possibility of organization of various types of educational activities;
- attestation (control of educational achievements);
- possibility of remote (distant) fully functionaltraining.

In the information space there is a wide variety of technologies, software, both for the formation of ICT competency, and for the use in professional activities.

A number of modern and advanced information and communication technologies can be distinguished.

Cloud technologies allow the teacher and the student to create information resources and to store them in the network information stores. The examples of integrated cloud-based free solutions for education are Google Apps for Education and Microsoft Live@edu, which have communications support tools in the form of instant messaging programs, along with the address book and task scheduler.

Web of the second-generation (Web 2.0) –is a kind of sites, where online content (internal content of the site) can be created by the users themselves. With regard to the education,Web 2.0 presents qualitatively new opportunities for building the educational process, since it allows to attract all students not only as consumers of educational content, but also as its active creators. Web 2.0 technologies help to put the student in the center of pedagogical process. As a result, he becomes more active in the creation of educational information and in the interaction with other participants of the training process. Services Web 2.0 include social networks, social bookmarks, online games, blogs, forums, communities, groups, comments, chats, online-encyclopedias (wiki), etc.

When solving a number of didactic tasks, Learning Management Systems (LMS) can be used. Modular Object-Oriented Dynamic Learning Environment (Moodle) is one of the most common. This system allows to create e-learning courses (network courses), including all necessary training, support and monitoring materials (or links to them), as well as methodological instructions, in accordance with the specifics of academic discipline and its work program .[7]

The main features of the system LMS Moodle are the following:

- wide opportunities for placement and updating of educational and methodological support of the e-learning course;
- thetools for counseling of trainees, the organization ofproblems discussion via forums and chats;

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[7] J. Cole, H. Foster, *Using Moodle.Teaching with the popular open source course management system*, 2nd edition, Sebastopol, O'Reilly Media Inc., 2008.

- the ability to monitor the work of listeners regularly, by viewing the statistics of visits;

- communication opportunities, the existence of active feedback, allowing the teacher quickly receive the works of the trainees, review them, correct mistakes and send them for revision;

- systemof supporting the exchange of files of any format;

- distribution service, allowing to inform all participants of the course about current events;

- the possibility of implementation of distance learning form.

Within the framework of the problem of development the information competency of future teachers in the process of performing scientific-research, course and final bachelor's works, the research subjects are focused on the development of electronic educational resources, based on the above-considered modern computer programs and educational environments.

The work on the designing of electronic educational resources in specific areas and topics involves resolving the following issues: 1) identification of characteristics of the problem approach to the topic; 2) definition of information needs; 3) tactics of information gathering; 4) the ability to work with information sources; 5) the ability to synthesize and to structure information, received from different sources, in a certain sequence, 6) creative approach to solving the posed tasks.

The students of the program track "Vocational training (branch-wise), profile: energetics" developed e-learning courses on the subjects of general energetics and electrical engineering, in accordance with normative documents and educational programs of secondary vocational education.

The structure of the developed courses is represented by the following categories: normative documents; glossary; guidelines; theoretical materials; didactic materials for practical training and independent work, monitoring and evaluation; video materials; literature and electronic sources.

During the development of relevant e-learning courses, the future teachers acquire the basics of interactive learning, the variety of ways and forms of presentation of teaching materials, the possibility of modular structuring of content, the creation and implementation of individual educational plan in professional activities, activation of various types of educational and cognitive activities. In addition, students not only learn to manage the educational process quickly and effectively, but they also acquire a certain vision of the position of modern teacher, his role as a mentor, assistant in the process of self-development of students.

Approbation of the developed e-learning courses was carried out during the period of students' pedagogical practical training, where developed courses were used as additional educational resources for traditional forms of education.

It should be noted, that modern students are psychologically ready for this form of work, and they get in gear with great pleasure.

Summary

The results of the conducted research on the problem of development of information competency of teachers in higher education institution allow to make the following conclusions:

• the information competency of a modern teacher is one of the most important indicators of the success of his activity, and at the same time it is a necessary prerequisite for further raising the level of his professional competency;

• in modern conditions, the development of information educational environment by teachers and the ability to actively use the resources of such environment in the educational process is of particular importance; and thisdetermines the importance of students' preparing for the designing and development of electronic educational resources, focused on the systematic use of ICT tools;

• the listed methodological and technological aspects of the development of teachers' information competency are actively implemented into the educational practice of the institute, and allow to specify the content of teacher's professional standardin terms of his ICT competencies.

Conclusion

Thus, the organization of work on the designing and development of e-learning courses on the basis of ICT tools, discussed above, contributes not only to mastering the relevant knowledge of ICT sphere, scientific-research activities, but, on the whole, it forms ICT competency of future teachers, raises the level of their teaching and methodical literacy, ability and readiness to organize an effective educational process.

In our opinion, the problems, considered in the article, are topical and require further study.