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Departamento de Ciencias Humanas
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Role of technology-enhanced learning environment at universities in shaping teachers' professional identity

Albina A. Chervova
Ivanovo State University, Ivanovo, Russian Federation; N.I. Lobachevsky National Research University, Nizhny Novgorod, Russian Federation, albina@mail.ru

Svetlana A. Zaytseva
Ivanovo State University, Ivanovo, Russian Federation
svetlana@mail.ru

Gennady M. Kiselev
Ivanovo State University, Ivanovo, Russian Federation; Moscow Regional Social and Economic Institute, Moscow, Russian Federation, gennady@mail.ru

Aleksey A. Mikhailov
Ivanovo State University, Ivanovo, Russian Federation
aleksey@mail.ru

Galina E. Muravyova
Ivanovo State University, Ivanovo, Russian Federation
galina@mail.ru

Elena I. Rzaeva
Ivanovo State University, Ivanovo, Russian Federation
elena.i@mail.ru

Elena V. Sitnova
Ivanovo State University, Ivanovo, Russian Federation
elena.v@mail.ru

Mikhail V. Sheptukhovsky
Ivanovo State University, Ivanovo, Russian Federation
mikhail@mail.ru

Abstract

The research objective is to develop and implement the model of the technology-enhanced learning environment of pedagogical universities, meeting the needs of today's digital society, complying with the requirements of legislation and facilitating would-be teachers' training for effective professional activities. The study is based on environment-oriented, competence-oriented, culturological, and informational approaches. The main result is the developed structure of the technology-enhanced learning environment of universities, consisting of four blocks. In conclusion, the use of TELE tools considerably changes the role and

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essence of interaction between the educational process subjects. Students' interests, cognitive needs and psychological characteristics become high priority issues.

Keywords: Information, Communication Technologies, Student, Teacher.

Papel del entorno universitario de aprendizaje potenciado por la tecnología en formar identidad profesional de docentes

Resumen

El objetivo de la investigación es desarrollar e implementar el modelo de entorno de aprendizaje con tecnología mejorada de las universidades pedagógicas, satisfaciendo las necesidades de la sociedad digital actual, cumpliendo con los requisitos de la legislación y facilitando la capacitación de los futuros docentes para actividades profesionales eficaces. El estudio se basa en enfoques orientados al medio ambiente, orientados a la competencia, culturales y de información. El resultado principal es la estructura desarrollada del entorno de aprendizaje con tecnología mejorada de las universidades, que consta de cuatro bloques. En conclusión, el uso de las herramientas TELE cambia considerablemente el papel y la esencia de la interacción entre las materias del proceso educativo. Los intereses de los estudiantes, las necesidades cognitivas y las características psicológicas se convierten en temas de alta prioridad.

Palabras clave: Información, Tecnologías de la Comunicación, Alumno, Profesor.

1. INTRODUCTION

One of the main systemic requirements for implementation of the basic educational programs of primary, general secondary and

higher education defined by the federal education standards for various levels of education is the establishment and functioning of the technology-enhanced learning environment (TELE) at educational institutions (Kiselev and Chervova, 2014). Effective TELE functioning at an educational institution requires – along with the availability of necessary hardware and software and a complex of modern pedagogical technologies – a high level of information and communication competency of teachers involved in the educational process. The issues considered in our study are of particular relevance due to the need for a scientifically justified approach to resolving the contradiction between the current social demand for the teachers capable of effective professional work in TELE conditions and the existing insufficient level of preparedness of the main part of the graduates of pedagogical schools of higher education for practical implementation of the requirements of the Teacher Professional Standard to professional activities in the technology-enhanced learning environment.

2. METHODOLOGY

The theoretical framework for the study is based on the works dedicated to informatization of the national system of education Fartash et al. (2018), Davoudi et al. (2018) and other scholars. The primary approach used to address the research topic is the environment-oriented approach developed by Raven. According to his

ideas, the environment in which a person lives and, in particular, receives education exerts both direct and indirect influence on the person. On the one hand, the environment imposes restrictions on personal activities and behaviour, providing the person with mechanisms for interaction with other people and functioning to achieve personal goals. On the other hand, the environment indirectly forms the personal competencies that are needed to realize personal goals in the environment in which the person carries out professional activities and motivates the person to adopt the mode of behaviour typical for this particular environment (Raven, 2002; 2017).

The modern electronic information environment is a digital version of the information field surrounding a person, supported by a combination of hardware and software. The development of modern information and communication technologies has made the electronic information environment one of the most important parts of the general human environment. The main components of the electronic information environment include electronic resources, means of communication and the information infrastructure. The federate state standards of secondary education connect the notion of learning environment with the school regulations and define it as a set of interrelated components, such as material resources of the educational institution, educational process management, catering organization, medical assistance provisions and the psychological climate in the school. Khutorskoy (2002) interprets the learning environment as both natural and artificially created socio-cultural environment, including the content of education and various types of instructional tools and

software that can contribute to students' effective cognitive activity. Robert (2010) identifies the technology-enhanced learning environment as a computer-based learning environment and defines it a set of conditions ensuring implementation of the user's activities involving an information resource through the use of interactive ICT tools and interacting with the user both as a subject of information communication and a personality. Following the concept defined by Robert, the term TELE used in our study takes into account today's electronic characteristics of the learning environment.

So, TELE is a dynamically changing system reflecting the achievements of scientific and technical progress and the educational research results; it includes IT objects and interfaces between them, communication means and technologies, organizational and legal structures supporting IT processes and psychological, pedagogical and methodological developments aimed to support the educational process. Based on the above-reviewed definitions, we consider the technology-enhanced learning environment in teacher training as a complex system combining the intellectual, psychological, pedagogical and methodological potential of the higher education institution and the functional components and content of communication between all participants in the educational process with the necessary technical, organizational and software resources.

3. RESULTS

We have developed a TELE structure to be used in teacher training, consisting of four interrelated content blocks :

1. A database of organizational and regulatory documents ;
2. Interactive and distance learning support;
3. A referral information system;
4. A database of student projects, demonstrating the learning achievements of would-be teachers.

The database of organizational and regulatory documents includes the main legislative documents and guidelines regulating the training of future teachers in higher education institutions. They include the Federate State Standards of Higher Education, Teacher Education Program, Curriculum, Academic Calendar, steering documents for academic disciplines and practical training, collections of assessment tools, rating system regulations, etc. The future teachers study the documents of this block in the process of pursuing all disciplines of the academic curriculum. Thus they gain experience of working with legal and regulatory documents in the field of education, have the opportunity to forecast their learning route, assess the formed level of competencies that are needed to fulfill their future professional duties, and monitor and correct the process of their education (Chadaeva, 2016).

The interactive and distance learning support allows the instructors to create conditions for organizing productive independent work of students and effectively monitor and evaluate their academic achievements. About 50% of the time provided for studying each discipline of the curriculum is allocated to the independent work of students, including individual and group tasks. The effectiveness of independent work is determined by its planning, educational and methodological support, constant feedback from the instructor through the TELE tools and students' self-monitoring and reflections in the process of performing individual independent tasks. For students to perform their projects and research work in groups, TELE functions provide for the possibility of organizing on-line interaction between students. Using the TELE telecommunication tools, the future teachers gain experience of participation and interaction with colleagues in on-line communities and can understand the prospects of using all the potential of Web services in their future professional activities (Gruzdeva and Zaytseva, 2014; Smirnova et al., 2016).

The change in approaches to organizing the assessment and rating of students' activities, which is related to the introduction of new educational standards aimed at testing and assessing the level of formation of necessary competencies in future teachers, resulted in the introduction of a new system of criteria and rating assessment of students' academic achievements at higher education institutions. The technology-enhanced learning environment of higher education institutions has sufficient functionality and considerable potential to increase the assessment efficiency through the use of monitoring

programs, providing for automated monitoring of the dynamics of academic achievements of each student and predicting the final results of the future teacher with the help of statistical research methods. The controlling component of TELE includes an analysis of students' educational results, students' reflection on their own activities, and the necessary correctional measures (Chervova and Bakhtiyarova, 2003; Chervova and Gruzdeva, 2008; Chervova and Teplaya, 2009; Tastan et al., 2018).

The referral information system includes reference and information retrieval systems, databases and knowledge bases, electronic libraries, electronic encyclopaedias and other resources. The purpose of the referral information system is to ensure systematization, storage, search and presentation in the desired form of the educational information for students and instructors. The referral information system can be built as a distributed database. Part of the information resources is available for the educational process participants on the external web-servers of the library systems of other higher education institutions or organizations, the Russian academic research library elibrary.ru, the Federal Centre of the Information and Educational Resources and other online resources. The data stored locally in the information network of the higher education institution is either information relevant only for students of this particular institution (for example, class schedules and the regulations of the Student Council) or the most relevant and important reference information, the availability and timeliness of which allows students and instructors to save time and efforts for finding it on external websites.

The database of student projects includes the following: course papers, graduation projects and Master's theses of the students and graduates; references to or copies of articles and abstracts of student publications in journals or collections of academic papers; research projects, methodological research studies, materials of students' teaching practice and experimental work. An important element of the TELE database of student projects is the storage of student portfolios, which are filled in by the students themselves during the course of their studies at the higher education institution. The portfolio content would provide for a thorough presentation of the future teacher to prospective employers and allow assessing the capacities and abilities of each individual student (Zaytseva and Plisova, 2016; Chiang & Tzou, 2018).

4. DISCUSSION

The didactic potential of the TELE application in pedagogical schools of higher education is based on the fact that two significant educational tasks are fulfilled at the same time: management and support of the educational process in the higher education institution in accordance with the regulatory and legislative documents; and future teachers' development in the environment that is as close as possible to the technology-enhanced learning environment of their future professional activities. From the perspective of the first of these tasks, it should be noted that the main function of a higher school instructor is not to transfer information, but to manage the process of students'

learning. The TELE application to fulfil this task is based on a certain didactic concept determining the selection of content, methods, organizational forms and means of teaching to achieve pedagogical goals, including The formation of professional competencies of future teachers, including the ICT competency ;

- Students' acquisition of necessary knowledge, skills and practical experience while studying higher education disciplines;
- Development of students' skills of self-organization and independent learning and cognitive activities.
- From the perspective of the second didactic task of teacher training at pedagogical schools of higher education, TELE helps to achieve the following goals:
- To develop students' skills and abilities to assess the significance of educational normative and legislative documents and working with information in the educational institution TELE; to help students to learn constricting the TELE structure and filling it with information;
- To form future teachers' ability to work in a team to cope with common pedagogical tasks.
- The implementation of above-listed didactic goals of the educational process is ensured through TELE structuring with the use of modern information technologies that have a number of properties, ensuring

- Systematization, storage, processing and transmission of large volumes of different types of information – Visual and audible, static and dynamic, textual and graphics;
- Organization of access to various information sources;
- Use of modern software – both educational and professional – to solve educational problems;
- The organisation of electronic audio- and video-conferences.

All identified didactic applications of TELE tools can be effectively implemented in higher education, if their use is justified by the needs of both the educational process and the future professional activities of teachers.

5. CONCLUSION

We have identified the following main results of TELE implementation for teacher training:

Formation of future teachers' information and communication competencies in creating and using the educational institution TELE to ensure the modern level of education;

1) Support of the educational process in the higher education institution with all necessary educational and methodological materials, software products and electronic educational resources;

2) Students' adaptation to their future professional activities in today's socio-cultural environment;

3) Students' orientation to the active use of modern educational information and communication technologies for the educational program implementation ;

4) Integration of information and communication technologies into the system of studying academic disciplines and the methodological, psychological and educational preparation of students for their future activities;

5) The motivation of students' involvement in research and project activities.

The use of TELE tools considerably changes the role and essence of interaction between the educational process subjects. Students' interests, cognitive needs and psychological characteristics become high priority issues. A specific feature of the educational process organization in the technology-enhanced learning environment of pedagogical schools of higher education is the focus on providing opportunities for students to realize their full potential and develop their cognitive abilities. At the same time, the created technology-enhanced learning environment is a dynamically changing system, designed by teachers and the educational institution to realize the needs of the information society and the system of education. Therefore, teachers' preparation for work in the TELE conditions should focus not only on the solution of the tasks of today's education, but also on the readiness to meet the challenges that the teachers may face in the future (Chervova and Lagunova, 2001; Chervova and Zolotukhina,

2009; Zaytseva, 2011; Zenkina, 2008; Davoudi et al., 2018; Fartash et al., 2018). Materials of this article may be useful for students, postgraduates and academic staff members of pedagogical schools of higher education.

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