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MODERNIZING E-LEARNING CONTENT DESIGN FOR TEACHER EDUCATION

Methods of e-learning becomes an important direction of higher pedagogical education and postgraduate training. The new generation of teachers which is growing in digital world needs to have appropriate competences in e-learning methodology for pedagogical interaction and support the development of students' abilities.

Keywords: e-learning, e-content design, pedagogical education, ICT competences of teachers.

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МОДЕРНИЗАЦИЯ РАЗРАБОТКИ СОДЕРЖАНИЯ ЭЛЕКТРОННОГО ОБУЧЕНИЯ ДЛЯ ПЕДАГОГИЧЕСКОГО ОБРАЗОВАНИЯ*

Методы электронного обучения становятся важным направлением высшего педагогического образования и послевузовской подготовки. Новое поколение учителей, которое растет в цифровом мире, должно обладать соответствующими компетенциями в области методологии электронного обучения для педагогического взаимодействия и поддерживать развитие способностей учащихся.

Ключевые слова: электронное обучение, дизайн электронного контента, педагогическое образование, ИКТ-компетенции учителей.

Introduction. The situation in the sphere of education is changing under the acceleration of society development, digital transformation of economy, evolution of traditional pedagogy and didactics toward e-didactics and e-pedagogy. Thus forming ICT competences of a teacher today can not completely decide the problem of effectiveness pedagogical education according modern requirements. Methods of e-learning (e-didactics) becomes a key direction of training at the level of higher and in continuous pedagogical education. In this

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case E-learning content design for teacher education in pedagogical university requires timely update of digital environment development for quality support. Together with the formation of new e-learning methodology, the requirements for creating e-content are also changing. This system is very dynamic, which causes certain difficulties in the continuous support of high quality e-courses.

Experience in e-learning technologies implementation in teacher education. In Belarus e-learning is a growing trend in education as well as in the world. Most universities of the Republic of Belarus use in different ways e-learning technologies for the implementation of educational programs, advanced training. Pedagogical features, advantages and disadvantages of e-learning technologies in Belarus have been studied earlier (Zhuk A., Listopad N., 2002, Tavgen I., 2003, Brezgunova I., 2005, Puptsev A., 2013, Grinevich E., 2014; Gaisenok V., Maksimov S.I., 2016, etc.), however, the pandemic of COVID-2019 in the world pushed these technologies to the first place. In this regard, researchers from different countries have identified new psychological and pedagogical problems and challenges: the lack of "live" participation and the high demand for the development of self-management skills among students [1-3], changes in the organizational and pedagogical conditions of e-learning and the quality of e-learning [4, 5]. At the same time, most researchers believe that after the pandemic, the level of e-learning dissemination in education will lead to the formation a new didactic theory of e-learning.

The experience gained, as well as the developed new organizational and methodological approaches, the testing of various forms of networked pedagogical interaction confirmed the viability of the e-learning model as a digital ecosystem, tested on the basis of Belarusian State Pedagogical University named after Maxim Tank (BSPU) - the leading pedagogical university in Belarus. In particular, the e-learning model in a pedagogical university is understood as a digital ecosystem that integrates various services, electronic educational resources, internal and external subjects, connected by the common task of teacher training. At the same time, e-learning in a pedagogical university is considered from two closely related sides: as a means of construction the special e-information-educational environment and the goal of teacher education for forming professional competencies in e-learning.

The created electronic educational and methodical complexes, a repository of scientific and educational documents, a video repository, systems for conducting webinars and online lectures are quite successfully used in addition to the traditional educational process for organizing: independent work of students, conducting consultations, organizing current and intermediate control, providing design work of students. Also the experience in e-learning technologies implementation was accumulated in BSPU by the participation in 2017-2019 in Erasmus + project "Innovative ICT Education for Social-Economic Development" (IESED) (Project number 574283-EPP-1-2016-1-LT-EPPKA2-CBHE-JP) [6].

On the basis of the IESED project the integrated profile of an ICT specialist was created and used for designing the goals and objectives of all curric-

ula and teacher training programs in the field of information and communication technologies. The following competencies were included in the ICT specialist profile: analyze the prospects and directions of development of information systems and technologies; design data structures for use in information systems, operational analysis systems and intelligent systems; perform modeling, design software and documentation for the implementation of activities in various subject areas; conduct comprehensive testing of the developed software products and application software; plan and organize automated support for various events; be able to apply basic scientific and theoretical knowledge to solve practical problems; be able to work independently and in a team; be able to generate new ideas focused on creativity, critical thinking, communication and collaboration; develop and optimize models of various systems and processes [7, 8].

Directions of modernizing E-learning content design. According ICT specialist profile the following features of modernizing E-learning content design for teacher education were identified:

- the key point of e-learning is managed independent work of students in the framework of distance interaction, which requires its planning and full organizational, methodological and technical support;
- the development of study e-course should be carried out on the basis of e-learning pedagogical design which takes into account the building competencies, requirements for the optimal choice of study tasks, their complexity and time limits;
- the duration of e-course is calculated according to the number of hours for student's independent work, indicated in the curriculum;
- maintenance modularity and stages of e-course realization (mandatory and variable study designs, regular consultations, comprehensive and timely informing and control);
- changing the forms of student's learning and self-learning (conversion lectures into an electronic form for self-study, increasing practice-oriented activities (in blended learning model)
- changing of the teacher's workload (the number of hours for lectures, diploma's works (master's theses) are distributed for online events, organizational and methodological support as part of e-course;
- changing the forms of consultations, both group and individual, the possibility of communication between students and teachers is provided in the offline mode (forum, personal messages) and online (webinars, web conferences);
- high level of interactivity provided by multimedia tools, LMS tools (Moodle, Adobe Connect, etc.);
- providing a rating assessment of students' competencies, systematic control (self-control) of knowledge acquisition based on LMS tools (Moodle, Adobe Connect, etc.);
- regular current or thematic control by the teacher of the discipline in the form of online events (webinars, online consultations) for personalized feedback, as well as using automated control tools (tests, surveys).

As a result, the plan of e-course includes a combination of: 1 – independent work of students with various sources of information, educational materials specially developed for this course and open educational resources; 2 – active and systematic blended interaction with the teacher, supervisor, tutor; 3 – group work in the form of "training in cooperation" with the rest of the students in this course. To ensure the quality of e-learning, the creation of e-content must meet the following common didactic principles: scientific character and accessibility; the conscious and active participation of students in the education process; thorough acquisition of knowledge, skills and abilities; reverse connection (of feedback or retroaction); development of the intellectual potential of the student; connecting theory with practice. And e-didactic principles: computer visualization of educational information; providing interactive dialogue; e-learning usability [9].

Conclusion. Let us summarize the progress of modernizing of e-learning content design for teacher education. During the IESED project realization BSPU created 7 new e-courses (“IT-technologies in Education”, “Technology of Pedagogical Interaction Network”, “Operational Systems”, “English for Specific Purposes”, “Team-building”, “Psychology of Information Perception”, “Management of IT Projects” with partner universities. These courses played the role of examples for modernizing other e-learning courses for teacher education and demonstrate methods and means used for presenting educational material:

- modularity – the distribution of educational material into sections, modules, topics in accordance with the perception and memory of students, eliminating the overload of students in the scenarios of the student’s interaction with the resource;
- multi-level – a different degree of difficulty of the educational material, focused on a different level of student preparation and a different level of motivation for (self)learning;
- media resource – the use of all available forms of presentation of educational information: text, image, animation, video, audio, infographics, computer models, etc.
- modifiability – the ability to update and correct content, combine or integrate it with other software products.

E-content in new courses are more student oriented and: is providing an active approach to (self)learning; has axiological orientation – contributes to the enrichment of motivational-value sphere of students; has enough training materials and (self)learning activities to form competencies, knowledge, skills of the target group of students; contains components that ensure individualization and differentiation of e-learning process, the formation of an individual trajectory of self-control and self-test.

Also the structure of e-courses has been changed. In previous version of e-courses teachers used too narrow list of e-tools in LMS Moodle, platforms for webinars. Now the basic structure of standard e-course in LMS Moodle is changed and contains different tools, which are required when developing e-content (Table 1).

Table 1

MODULES	CONTENT ELEMENTS	BLOCKS AND COURSE RESOURCE IN LMS MOODLE
Module 1 "Organizational and methodological"	Study course description	File, Learning plans block"
	General instructions	File
	Training Schedule and Online Events Calendar	Calendar, Upcoming events block
	Consultations, webinars	Activities block (Forum, Survey, Choice, Quiz etc.), Webinar (Adobe Connect)
	The list of formed competencies	Course competencies
Module 2 ... N "Thematic"	Theoretical section	Lecture, Page, File, Interactive Video Lecture (Adobe Connect), External Application, Lesson activity block
	Practical section	Survey, Seminar, Test, HotPot, Activities block (Forum, Survey, Choice, Quiz etc.), Workshop activity
	Assessment	Questionnaire block, Workshop activity
	Additional resources	Book, File, Folder, IMS content package, Label, URL, Glossary, YouTube block, Repositories
Module N «Final »	Final assessment (rating) of students results	Questionnaire block, Portfolio, Outcomes, E-course evaluation form (quality of the course) Activity report, Competency breakdown report, Course activity reports.

Combining of different tools for e-learning content development allowed to create and develop in the digital ecosystem of BSPU an online education subsystem. The subsystem is focused on the formation of a new type of e-learning content – interactive, designed for LMS “Moodle”, MOOC platforms (“Stepik” and others). It helps to form teacher's ICT competences, which focuses on specific skills in e-didactics.

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