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METHODOLOGY OF DESIGNING E-LEARNING COURSES FOR THE PROFESSIONAL (VOCATIONAL) EDUCATION SYSTEM IN WAR AND POST-WAR TIMES

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Abstract

Relevance: modern conditions of educational activity have made distance and blended learning more relevant; most of the teaching staff of professional (vocational) education institutions (hereinafter – P(V)E) chose the Google Classroom platform and the Google Meet video conferencing tool to provide training, but there is no single methodology for designing e-learning courses using these digital tools.

Aim: determination of the main components and stages of the methodology of designing e-learning courses for professional (vocational) education.

Methods: analysis of the source base – to determine the state of study of the problem; survey – to identify the design features of e-learning courses in P(V)E institutions; generalization – for formulating conclusions regarding the main components and stages of the methodology of designing e-learning courses for P(V)E institutions.

Results: established the priorities of teachers of P(V)E institutions in choosing digital platforms for conducting blended learning (84.4% of pedagogical workers of P(V)E institutions conducted classes and assigned tasks using the Google Classroom platform, and 74.5% of those interviewed for the organization of video conferences chose Google Meet); the specifics of the methodology for designing e-learning courses for blended learning in the P(V)E system in wartime and post-war times (based on the digital tools of the Google Workspace for Education environment, since they are used by the majority of pedagogical workers of P(V)E institutions); the features of these tools are revealed (easy to use, adaptive, take into account different conditions and technical capabilities of the participants of the educational process, allow taking into account the individual characteristics and educational needs of students); the state of study of the problem in scientific sources was clarified (Ukrainian teachers and scientists distinguished from four to eight stages of designing e-learning courses and determined the different functional content of these stages); the optimal selection of the stages of the methodology of designing e-learning courses for blended learning (ADDIE: Analyzing, Designing, Developing, Implementing, Evaluating) is proposed, expanded and adapted for the needs of blended learning in P(V)E institutions in war and post-war times.

Conclusions: the method of designing e-learning courses for blended learning in the P(V)E system in war and post-war times is defined as a set of interconnected methods, forms and means of developing an e-learning course in the Google Workspace for Education environment; has five main stages of ADDIE design, taking into account the pedagogical processes necessary for blended learning in P(V)E institutions in war and post-war times; contributes to the development of a clear algorithm of interaction between teachers and students, the organization and support of pedagogical processes in the e-learning course, taking into account the peculiarities of the learning process and the individual characteristics of students.

Keywords: *professional (vocational) education, blended learning, e-learning course, methodology of designing e-learning courses*

Introduction. The modern conditions in which the educational industry of Ukraine is located have actualized new approaches to learning. Mobility and lack of attachment to the place and time of

classes have become the main requirements of all branches of education. Quarantine-related restrictions have led to a significant increase in the role of distance and blended learning. In the future, the implementation of the training process in the conditions of martial law made its corrections, training became possible not according to the schedule, but in the presence of the necessary conditions and resources.

In 2022, the Laboratory of Distance Professional Education conducted a survey among pedagogical workers of P(V)E institutions regarding the main forms, means, methods as well as problems of conducting blended education. Thus, according to the results of the survey, 30.7% of teaching staff sent assignments to students through social networks and messengers; 78% of respondents carried out control of educational results during online learning with the help of electronic testing.

51% of pedagogical workers indicated that daily online classes were held and tasks were performed on various platforms; classes were conducted and tasks were performed using the same platform - 50.5% of employees. Google Classroom became this platform for the vast majority of teaching staff (84.4%). Also, 74.5% of respondents indicated that Google Meet has become a digital tool for organizing video conferences.

Blended learning is an approach in which the main forms of learning - educational courses, lectures, and practical classes are used in a mixture with others, such as independent work, distance learning, and learning technologies. They are used to satisfy the requirements of the students of education and to convey a larger amount of information. Along with online classes, the use of e-learning courses has become relevant in blended learning for remote interaction with students.

Given the results of the survey, we can talk about the need to create a methodology for designing e-learning courses using Google Classroom and other Google products for education.

The objective of the article is to determine the main components and stages of the methodology of designing e-learning courses for professional (vocational) education.

Research methods: analysis of the source base - to determine the state of study solving of the problem; survey - to identify the features of designing e-learning courses in P(V)E institutions; generalization - for formulating conclusions regarding the main components and stages of the methodology of designing e-learning courses for P(V)E institutions.

Results and discussion. Blended learning is an approach to learning that includes the use of online and offline learning materials to achieve educational goals. Within the framework of blended learning, it is possible to use digital tools for audio or video films, educational applications, group discussions, etc. The main goal of blended learning is to expand learning opportunities for students and provide them with an optimal educational environment.

Google has tons of resources that can help you create an eLearning course. One of the most popular tools is Google Classroom. It is a free platform that allows you to create and organize training courses for students. It allows you to create student accounts and send them homework, tests, and access to manuals and other educational resources. Google Classroom provides the possibility of automatic assessment of homework and a system of messages for exchanging information between students and teachers.

Google has developed other tools to help expand learning opportunities. For example, Google Slides allows you to create presentations, and Google Forms can help you receive and collect information from students. With the help of Google's digital tools for education, you can develop online lectures, video tutorials, spreadsheets, e-mail, social networks, and interactive dialogues for educational purposes. The use of such tools allows the P(V)E institution to provide a convenient and effective learning process for students.

An e-learning course (ELC) is a set of educational and methodological materials and educational services created for the organization of individual and group training using electronic technologies.

Google Classroom is a free digital platform for creating educational courses for P(V)E institutions and users with private Google accounts. In it, you can create e-courses, as well as assign and check tasks. You can develop a e-learning course on the platform; enroll students on it; distribute educational material and tasks among course participants; evaluate these tasks, monitor the progress of tasks; organize students' communication.

This environment works on different devices (phone, tablet, laptop); the software is provided free of charge for use in Ukraine; there are many methodological materials on the use of the software.

The simplest option for distributing roles in Google Classroom is the teacher-student model. The teacher places materials, attaches files, and creates tasks, students get acquainted with information, do homework, and familiarize themselves with the

evaluation of completed tasks. In Google Classroom, you can post comments, and return tasks for revision.

Google Classroom also has administrator and curator roles. Supervisors simply monitor students' performance without having access to the course, receiving evaluation results by mail. Administrators can see all courses, participants, and their work, operating on the roles of participants.

Google Classroom, Gmail mail, Google Drive, and Google Docs are combined into a single system that provides free mutual use of text content, videos, and images for the use of interactive learning methods.

Exercises are published in the «Tasks» tab. Knowledge can be tested in several ways: survey, test, Blank Quiz template, and others. Both the grading scale and deadlines can be adjusted to meet the teacher's needs.

Students can view assignments in the feed, in the course calendar, or on the To-Do List page. Tasks have the statuses «assigned», «not submitted», and «completed». An individual task can be assigned to an individual student.

You can create tasks using Google Forms, which are also integrated with Google Classroom. You can create tests with a choice of one or more answers and open-ended tasks, by using pictures and videos. After students have completed the tasks, the teacher automatically receives a notification.

Any method of developing an e-learning course has a certain algorithm, the sequential execution of certain stages. The number of these stages and the processes described in them depends on the chosen technique. However, it is possible to single out the most general, basic stages of the development of e-learning courses: definition of course goals; choosing a platform for conducting the course; creating the structure of the course and its content; saving and downloading materials for the course; creating tests and tasks to test knowledge; introduction of additional resources for students; launch of the course and start of its implementation; processing the results and completing the course.

The most common modern system design method is ADDIE. This is an abbreviation of the first letters of the English names of the main stages of development, there are five of them: Analyzing, Designing an e-learning course, Developing it, Implementing the main processes, and Evaluating the results of the project/course.

The ADDIE system approach was applied by Ukrainian scientists and teachers to the development of e-learning courses (Bykov, Kukharenko, Syrotenko, Rybalko, & Bogachkov, 2008, p. 31-33), and it has the following components:

1. Analysis – educational activity is analyzed and tasks related to its formation are determined following the needs.

2. Design – the sequence (algorithm) of training is determined, and approaches, methods, and goals of the training are chosen and constructed.

3. Development of the designed educational system.

4. Implementation (implementation) - target training.

5. Evaluation, current and final.

Jerold Kemp's teaching design model has seven main stages: 1) analysis (resources, conditions, characteristics of the audience); 2) determination of priorities and standards; 3) determination of development goals and directions; 4) selection of educational content, environment, strategy, scenario; 5) development of e-learning course, tests; 6) development and implementation of course modules; 7) assessment, revision of the course. We can see that this is the same ADDIE method with somewhat detailed stages of developing an e-learning course as a project.

The developers of distance courses at the University of Twente (Enschede, the Netherlands) create educational materials in ten steps, but these steps are also an interpretation of the ADDIE methodology: analysis (identification of needs and goals; analysis of the content of the educational course), design (development, design, programming of lessons; development of ways of organizing the educational process); development (collection of educational materials; development of an algorithm for their passage), execution (preparation of methodical materials, recommendations, instructions); preparation of educational modules); evaluation of the educational course and improvement of educational materials.

The majority of domestic developers of e-learning courses distinguish a different number of stages in the development of electronic courses (from three to ten), which can be grouped into four main, very general stages, which also contain all components of the ADDIE methodology (Artyushenko, Mozgova, Matyushko, Lytvyn, & Lebedynska, 2020; Bykov, Kukharenko, Syrotenko, Rybalko, & Bogachkov, 2008; Yagupov, Petrenko, Kravets, et al., 2019; Prykhodkina, Tymoshko, Zuieva, Sholokh, Noskova, & Lebid, 2021).

1. The organizational stage (analysis), during which the materials for the development of the training course are analyzed, their compliance with the requirements, the concept of the e-learning course is

developed, its goals are formulated, the final results of the course are determined, the model, methods, training tools are selected, the requirements for content of the course, performers and term of course development, etc.

2. The preparatory stage (design and development), during which a model of the learning process is developed taking into account the curriculum of the course, the structure, scenario, and components of the electronic course, the selection of software and digital tools is carried out to create the structural «framework» of the course and educational content, learning content is selected from existing or created.

3. The main stage (implementation) - with the help of the tools selected in the previous stages, the modules of the e-learning course are directly composed.

4. The final stage (evaluation) – the compliance of the educational materials of the course with the goals and objectives set in the first stage is checked, the identified errors are corrected, and the e-learning course is tested in the educational process.

Separately, it should be noted the detailing of the stages of the development of e-learning courses by the team of authors (Prokopenko, Pidchasov, Moskalenko, Dotsenko & Lebedeva, 2019), who developed eight stages of creating an electronic course and described the content of these stages in a structured manner. The first stage is the analysis of the target audience (the number and key characteristics of the contingent of students). The second stage is the formulation of goals and objectives for students, the purpose and final results of studying the course; the study of motivation, and features of stimulating students to educational activities. The third stage is the determination of conceptual (content) and procedural (types of activity) components of the course, the determination of criteria for selecting educational material for the course, determination of the subject and content of the course modules.

The fourth stage is the creation of the structure of the distance course and the development of the educational and thematic plan of the course (work program); selection and development of educational content; setting up the virtual learning environment for the course and creating the course structure in this environment; dividing the course into modules and topics that have their defined structure. The fifth stage is the selection of a system of forms of organization of students' activities, types of educational activities, and mechanisms of their implementation for students and tutors/teachers. The sixth stage is working on the content of the course, reviewing and processing the educational materials according to the formed system of requirements. The seventh stage is the development of forms of control of educational activities and the quality of students' knowledge, methods of feedback to students, and organization of reflection. The eighth stage is the evaluation of the pedagogical effectiveness of the created course.

Therefore, the development of e-learning courses is carried out within the ADDIE system approach: analysis, design, development, implementation, and evaluation.

The methodology for designing e-learning courses for blended training in the P(V)E system in war and post-war times is defined as a set of interconnected methods, forms, and means of developing an e-learning course in the Google Workspace for Education environment.

Target audience: managers, methodologists, teachers, masters of industrial training, and other pedagogical workers of P(V)E institutions.

The goal: to increase the level of professional and digital competencies of pedagogical workers of P(V)E institutions by mastering the system of theoretical knowledge and forming practical skills regarding the design of e-learning courses for blended learning and the organization of professional training of students using the Google Workspace for Education environment.

The main task is to acquire the knowledge and skills of pedagogical workers of P(V)E institutions regarding the basic methods of designing, developing, assigning, supporting, and using e-learning courses in blended learning.

The implementation of the methodology is carried out according to the five stages of ADDIE (Analyzing, Designing, Developing, Implementing, Evaluating), detailed for the needs of blended learning in P(V)E institutions in war and post-war times.

1. Analysis – educational activity is analyzed and tasks related to its formation are determined by needs, the target audience is analyzed (the number and key characteristics of the contingent of students), and the goal of training is determined (intermediate components: analysis of the target group, specialist activities, tasks, predicted learning outcomes; analysis/decomposition of skills; analysis of knowledge on which skills are based; general/special learning tasks; tasks related to the formation of learning activities); goals and tasks for students are formulated regarding the competencies that need to be formed, the purpose and final results of studying the course; the motivation and features of stimulating students to educational activities are studied. The

composition of the course development team is determined. Choice of learning model (rotational, flexible, self-mixing model, or advanced virtual model).

2. Design – the conceptual (content) and procedural (types of activities) components of the course are determined, the criteria for selecting educational material for the course, the subject and content of the course modules are determined; the sequence (algorithm) of training is determined, the approaches, methods and means of training are selected and constructed, the training activity is determined and the training scenario is created (intermediate components: sequence/algorithm of the training content; development of the curriculum project). The choice of a system of forms of organization of students' activities, types of educational activities, and mechanisms of their implementation for students and tutors/teachers. Exploring the capabilities of the Google Workspace for Education system for blended learning. Development of the model and structure of the distance course using Google Classroom.

3. Development of the designed system using the analysis of initial data; creation of the distance course structure and development of the educational and thematic plan of the course (work program); selection and development of educational content; setting up the virtual learning environment for the course and creating the course structure in this environment; dividing the course into modules and topics that have their defined structure; development of training exercises, materials, and tools, setting up the course and testing (intermediate components: lesson plan (program); presentation of the program; training tools; exercises). Development of forms of control of educational activities and the quality of students' knowledge, methods of feedback to students, and organization of reflection. Working with the Google Classroom service: creating an e-learning course in Google Classroom; filling the class with basic structural elements; creating various types of tasks: material, tasks with a test, questions, creation of a topic; attachment of educational materials to the course; their publication settings; customizing the course interface; entering tasks and activities into the course calendar for creating the main types of tasks and methods of responding to them; ways to copy and archive Google Classroom.

4. Implementation – teaching students using an electronic course (intermediate components: execution plan (algorithm); support protocol; feedback algorithm). Working with the Google Classroom service: inviting students to the course; monitoring and renewal of tasks and events in the course calendar; using Google Meet for video meetings (moderator functions; screen casting; setting camera visual effects; installing class recording extension; class recording technology; getting a link to the recorded session; demonstration of the Jamboard board during the video lesson); using Google Classroom as a learning management system (use of student mode, teacher mode; main tabs «flow», «people», «tasks», means of communication between teachers and students; means of evaluating students). Organization of joint work in distance learning (using Google Drive, creating folders in it and setting up sharing access, shared access to files, and joint work on them; joint work with Google document, Google sheet, and Google presentation in editing mode.

5. Evaluation. Ongoing student assessment is done for the interim results of each phase. The final assessment of students is carried out after the direct learning process, taking into account feedback (intermediate components: a plan of current assessment; list of necessary actions for current assessment; plan of final assessment; results of final assessment). Working with the Google Classroom service: creating various types of questionnaires and tests in Google Forms; registration, evaluation settings, receiving a link to the ready-made Google form; the processing of results; creating a summary table with test results.

Assessment of pedagogical effectiveness of the created course, reflection for teachers-developers of the course.

Results of the technique:

1) understanding by pedagogical workers of the possibilities of using the Google Workspace for Education system for the organization of blended learning in P(V)E institutions;

2) practical skills in the development of an electronic course, interactive interaction, organization, and support of the educational process using the Google Workspace for Education environment;

3) knowledge of the algorithm for creating Google Classroom as a learning management system and interaction between teaching staff and students in P(V)E institutions;

4) knowledge and practical skills in using the tools Google Meet, Google Disk, Jamboard, Google Forms, and other applications of the Google Workspace for Education system for professional training of students in P(V)E institutions in war and post-war times;

5) practical skills of pedagogical workers regarding the evaluation of the developed e-learning course and reflection on the results of its design.

Conclusions. Therefore, the e-learning course is primarily an educational project, this adds specific,

purely pedagogical, requirements to the development of the electronic course and requires pedagogical detailing of the five main design stages of ADDIE (Analyzing, Designing, Developing, Implementing, Evaluating) for the needs of blended learning in institutions P(V)E in war and post-war times. The methodology for designing e-learning courses for blended learning in the P(V)E system in war and post-war times is defined as a set of interconnected methods, forms, and means of developing an e-learning course in the Google Workspace for Education environment. This technique makes it possible to develop a clear algorithm of interaction between teachers and students, organization and support of pedagogical processes in an electronic educational course, taking into account the peculiarities of the learning process and individual characteristics of students.

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МЕТОДИКА ПРОЄКТУВАННЯ ЕЛЕКТРОННИХ НАВЧАЛЬНИХ КУРСІВ ДЛЯ СИСТЕМИ ПРОФЕСІЙНОЇ (ПРОФЕСІЙНО-ТЕХНІЧНОЇ) ОСВІТИ У ВОЄННИЙ ТА ПОВОЄННИЙ ЧАС

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Реферат

Актуальність: сучасні умови провадження освітньої діяльності актуалізували дистанційне та змішане навчання; більшість педагогічних працівників закладів професійної (професійно-технічної) освіти (далі – П(ПТ)О) обрали платформу Google Classroom та інструмент для відеоконференцій Google Meet для забезпечення навчання, однак немає єдиної методики проєктування електронних навчальних курсів з використанням цих цифрових інструментів.

Мета: визначення основних складових та етапів методики проєктування електронних навчальних курсів для професійної (професійно-технічної) освіти.

Методи: аналіз джерельної бази – для визначення стану вивчення проблеми; опитування – для виявлення особливостей проєктування електронних навчальних курсів у закладах П(ПТ)О; узагальнення – для формулювання висновків щодо основних складових та етапів методики проєктування електронних навчальних курсів для закладів П(ПТ)О.

Результати: встановлено пріоритети педагогів закладів П(ПТ)О у виборі цифрових платформ для проведення змішаного навчання (84,4 % педагогічних працівників закладів П(ПТ)О проводили заняття та надавали завдання з використанням платформи Google Classroom, а 74,5 % опитаних для організації відеоконференцій обрали Google Meet); визначено специфіку методики проєктування електронних навчальних курсів для змішаного навчання в системі П(ПТ)О у воєнний та повоєнний час (базування на цифрових інструментах середовища Google Workspace for Education, оскільки ними користуються більшість педагогічних працівників закладів П(ПТ)О); виявлено особливості цих інструментів (легкі в застосуванні, адаптивні, враховують різні умови та технічні можливості учасників освітнього процесу, дають змогу врахувати індивідуальні особливості та навчальні потреби учнів); з'ясовано стан вивченості проблеми в наукових джерелах (українські педагоги і вчені виділяли від чотирьох до восьми етапів проєктування електронних навчальних курсів і визначали різне функціональне наповнення цих етапів); запропоновано оптимальний вибір етапів методики проєктування електронних навчальних курсів для змішаного навчання (ADDIE: Analysing, Designing, Developing, Implementing, Evaluating), розширених та адаптованих для потреб змішаного навчання в закладах П(ПТ)О у воєнний та повоєнний час.

Висновки: методика проєктування електронних навчальних курсів для змішаного навчання в системі П(ПТ)О у воєнний та повоєнний час визначається як сукупність взаємопов'язаних методів, форм і засобів розроблення електронного навчального курсу в середовищі Google Workspace for Education; має п'ять основних етапів проєктування ADDIE, з урахуванням педагогічних процесів, необхідних для змішаного навчання в закладах П(ПТ)О у воєнний та повоєнний час; сприяє розробленню чіткого алгоритму взаємодії між викладачами й учнями, організації та супроводу педагогічних процесів в електронному навчальному курсі, врахуванню особливостей процесу навчання та індивідуальних особливостей учнів.

Ключові слова: *професійна (професійно-технічна) освіта, змішане навчання, електронний навчальний курс, методика проєктування електронних навчальних курсів*

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