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ANALYSIS OF METHODOLOGICAL FOUNDATION FOR DESIGN OF DISTANCE LEARNING COURSES

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Analysis of Methodological Foundation for Design of Distance Learning Courses

The article analyses existing theories of education process design that work regardless of mode and aim of study. It presents the most common approaches to implement design phase of distance learning courses.

The author considers methodology concepts and terminology, process of performing activity, project and technological type of organizational culture and its basic definitions: project, technology and reflection.

The paper analyzes the approaches applied when organizing education process, in particular when designing distance learning courses: designing as an algorithm for solving inventive problems; pedagogical design; ADDIE education design system, etc.

Key words: distance learning, distance learning courses, design

Distance learning is a newish mode of study that most closely corresponds to the principles of modern education: “education for everybody” and “learning throughout life”. Basis for intensive development of distance learning throughout the world and in Ukraine in particular is the increase in demand for high-quality educational services, educational environment expanding and development of the Internet and Web technologies.

The basic principles of the organization and implementation of distance learning in Ukraine are defined by Distance Learning Regulation [1]. It regulates distance learning in general education establishments, vocational schools, higher educational institutions and post education establishments or departments of higher educational institutions, research and educational institutions that provide postgraduate education.

Distance Learning Regulation specifies structure, functions, organization principles and standards and special aspects of distance learning system. Additionally, it states concepts and terminology.

Distance learning is a personalized process of knowledge, skill and cognitive methods acquisition that is carried out mainly due to mediate cooperation of remote members of education process in special environment that functions on the base of modern psychological and pedagogical and information and communication technologies.

Objective of distance learning is providing educational services due to applying modern information and communication technologies by certain academic levels according to state educational standards; by educational admission programs, foreigners training and advance training.

Task of distance learning is enforcement of the constitutional right to education and professional skill regardless of gender, nationality, social and property status, occupation, philosophical beliefs, membership of political parties, relation to religious, religion, health condition and place of residence according to their skills.

According to the law of Ukraine "On Higher Education" distance learning has gained the official status of separate mode of education on an equal basis with full-time, extra-mural education and externship [2]. And this is not without reason. It grants the following advantages to the learners: no fixed training schedule; learning at all reasonable time; the opportunity to continue learning while abroad; maximal provision with educational resources; consultations by competent lecturers; quality higher education capability for those who are not able to attend higher educational institutions due to physical abilities or professional engagement; opportunity to obtain one more (or combining) higher education [3].

Analysis of current state and lines of development of distance learning worldwide and in Ukraine has revealed that distance learning had been based on distance learning courses.

Distance learning course is an education activity arranged by a teacher for acquisition of structured information.

Distance learning courses operate in telecommunication informational and educational environment. Functioning of such environment should be based on quality distance learning course methodology and technology.

Analysis of research and procedural framework of distance learning has revealed that question of education process methodology had been covered in the works by V.V. Kraievskiy, O.M. Novikov, D.O. Novikov, K.K. Platonov, V.M. Monakhov, Ye.V. Bakhusova, etc. General theoretical and methodological problems of improving education process are studied by A.M. Aleksyuk, V.M. Alfimov, I.A. Ziaziun, A.I. Kuzminskiy, O.H. Kucheriavyy, N.M. Losieva, Z.I. Sliepkan, N.A. Tarasenkova, etc. Conceptual pedagogical regulations on distance learning are considered in the researches of V.M. Kukharenko, V.V. Oliinyk, P.V. Stefanenko, etc. Scientists V.M. Kukharenko, N.H. Syrotenko, V.Yu. Bykov, Yu.M. Bohachkov, V.V. Vyshnivskiy, M.P. Hnidenko, H.I. Haidur, O.O. Ilin, etc. explore the subject of distance learning methodology and organization and creating distance courses.

Recently there have been great changes in distance education. In particular, new pedagogical theories, social services, teaching methods and free online courses have been developed. That is why there is an objective necessity to study methodological principles for designing distance learning courses. This proves the urgency of the considered problem.

We shall consider methodology concepts and terminology at first.

Modern encyclopedias give the following definitions of methodology. “Methodology is a study of structure, logical organization, methods and means of activity” [4; 5; 6]. “Methodology is a system of principles and methods of organization and building theoretical and practical activity and this system analysis” [7].

Some scientists consider methodology as a method and tool to connect science and practice [8], the others – as a tool science assists practice [9], etc.

O.M. Novikov and D.O. Novikov give such definition: “methodology is a study of activity arrangement” [10]. This definition clearly determines the subject of methodology – activity arrangement. Scientists note that not every activity needs

arrangement and applying methodology but the ones that are aimed at getting objectively or subjectively new result. In other words, considering human activities as reproductive and productive, the second one needs applying methodology. Such definition of methodology allows considering it as the study of organizing any human activity: any practical professional activity (research, artistic, play, etc) on one side and individual and collective activity on the other side [10].

Organizing activity means arranging it into the entire system specified by certain characteristics, logical construct and its rendering (time structure) [10].

Activity characteristics include features, principles, conditions and standards of activity. Logical structure consists of the following components: subject, object, topic, forms, tools, methods of activity and its results [10].

Let us take a closer look at activity implementation process.

Historically, there are different types of basic organizational forms of activity called organizational culture in modern literature. V.A. Nikitin [11] mentions the following historical types of organizational culture: traditional, corporate-trade, professional and technological. O.M. Novikov refers to the last one as project-technological [10].

Modern type of organizational culture is project-technological. Terms “project”, “technology” and “reflection” are the key ones.

“Project is a time-limited targeted change of certain system with predefined requirements to result quality, possible expenses of means and resources and specific organization” [12]. In other words, project is a completed cycle of productive activity of certain human or collective, organization, enterprise or joint activity of many organizations and enterprises.

“Technology is a system of forms, methods and tools to solve the assigned task” [13]. Any project is implemented by a certain set of technologies.

Reflection is of paramount importance in activity organization – continuous-flow analysis of objectives, tasks, process and results [10].

Every project includes several development stages from having the idea to its total completion. Totality of development stages makes a life cycle of the project.

Life cycle is divided into phases, phases are into stages, stages – into steps [12]. Completeness of activity (project) cycle is determined by three phases.

- *design phase*, the result of which is a developed ideal model of designed system and a plan of its implementation (note that design is the initial phase of the project);
- *technological phase*, the result of which is system implementation;
- *reflexive phase*, result of which is implemented system evaluation and determination of further correction or new project kick-off [10].

So, productive activity is divided into separate cycles called projects. Process of activity implementation is considered as a part of project that is implemented in a certain time sequence in phases, stages and steps. This sequence is common for all activity types [10].

Education activity is productive activity because it is always aimed at subjectively new (for each certain learner) result. That is why there is a necessity for its arrangement that means applying a methodology. Education activity methodology can be based upon a triunity of project category phases: design phase – technological phase – reflexive phase [10].

In addition, methodologists note that “learner’s activity can be considered as a set (hierarchy) of education projects: for a pupil any education program is a training project that fulfills all attributes of the mentioned-above project definition. Study of certain education courses is education project as well (subprojects with regard to main project – education program), etc” [14].

Article objective is getting acquainted with the existing theories of education process design that operate regardless of education forms and goals; considering the most common approaches to implementation of design phase of distance courses.

Designing is a process and design methods compound methodology that require complex applying of different scientific fields and theories [15].

Designing as an algorithm to solve inventive tasks. H.S. Altshuller has considered designing as an algorithm to solve innovative tasks (ASIT) [16]. ASIT

focuses on solving substandard innovatory tasks necessary for education. It includes the following stages:

- 1) task analysis;
- 2) task model analysis;
- 3) determination of ideal final result and physical contradiction;
- 4) mobilization and use of resources;
- 5) applying information collection;
- 6) task modification or change;
- 7) analysis of physical contradiction remedy;
- 8) applying the obtained answer;
- 9) solution course analysis [15].

Pedagogical design. Pedagogical design is applying and development of technical design ideas to pedagogical activity with the use of all existing pedagogical theories and innovative practice.

Pedagogical design is a complex task which should be solved with account of socio-cultural context of considered problem. Socio-cultural, psychological and pedagogical, technical and technological, organizational and managerial aspects interact and complement each other in it [17].

Pedagogical design substance is creating acceptable options of future activity and predicting its results. This is complex multilevel activity. It is implemented as a number of sequential stages making feature activity closer from general idea to certain actions [18].

Scientists note that pedagogical design is “an element of system, individual or collective pedagogical activity that consists of stages of modeling, design and construction and it is aimed at substantiation of implementation methods for pedagogical ideas” [19].

Pedagogical modelling supposes developing model as general idea of creating new pedagogical object and determining the basic ways of its implementation.

The project is created at the stage of pedagogical design (developed model is specified for certain pedagogical conditions and there is an opportunity of its practical application).

Project specification to basic components of objects including to particular actions of real participants of pedagogical processes is carried out at the stage of pedagogical construction [20].

Stages of pedagogical design and operating results are listed in table 1.

Table 1

Stages of pedagogical design [19]

No.	Stage	Stage result
1.	Modelling	Pedagogical model – conceptions of development, statutes, regulations, pedagogical theories and individual concepts that reflect pedagogue’s views.
2.	Designing	Pedagogical project – curriculums, qualification profile, methodological recommendations, etc.
3.	Constructing	Elements of pedagogical constructions – plan-notes, supportive notes, scripts, control schedule, didactic materials, class timetable, etc.

System of education design. Methodologists consider system of education design as “a system (led to system) knowledge (principles) management upon a condition of effective learning activity in the course of designing, development, evaluating and applying of educational materials” [21].

When designing learning process, a system approach ADDIE is applied. It supposes the following phases: 1) **A**nalysing organization needs; 2) **D**esigning a system for organization needs; 3) **D**eveloping system with the use of analyzing; 4) **I**mplementing system processes; 5) **E**valuating project creation and execution.

Phases of system approach upon a condition of education design when creating distance learning course are listed in table 2.

Table 2

Phases of system approach upon a condition of education design

Phases	Intermediate results
Analysing – it includes activity analysis and defining tasks regarding its formation, defining target group characteristics, analysis of necessary skills and knowledge and defining education goal.	Analysis of the target group. Analysis of expert activity. Tasks analysis. Analysis/decomposition of skills. Analysis of knowledge, skills are based on. General tasks of education. Tasks on forming activity.
Designing – defines the sequence of training, defines or constructs the methods and resources for education, describes educational activity (through examples and researches) and creates a script (educational pattern).	The sequence of learning content. Choice of teaching methods. Choice (or creation) of training resources. Education program designing.
Developing – development of distance learning course according to the pattern, creation of exercises, materials and resources, course and test adjustment.	Class schedule. Course presentation. Training resources. Exercises. Knowledge and skills control (including tests).
Execution – training with the chosen audience.	Execution plan.
Evaluating – includes two types of evaluating: current and summative. Current evaluating is carried out for the intermediate products of every phase. Summative evaluating is performed after education process where the process and its effectiveness are controlled with consideration for feedback.	Plan of current evaluating. List of necessary actions for current evaluating. Plan of summative evaluating. Results of summative evaluating.

The other approaches are used in addition to the ADDIE when creating distance learning courses.

So, Jerold Camp has proposed the following model of education designing:

- 1) analysis of needs, resources, conditions and characteristics of students;

- 2) defining results, priorities and standards;
- 3) writing goals, execution development;
- 4) choice of content, educational environment, education strategies and delivery system;
- 5) making courses and tests; revision and validation of training prototypes;
- 6) development and implementation of course modules;
- 7) evaluating and second revision of the course [21].

Scientists from the University of Twente (Enschede, Netherlands) propose 10 steps of production loop for developers of the Internet educational materials:

- 1) defining the needs and goals;
- 2) collecting material;
- 3) introduction into content of distance learning course;
- 4) advancement of ideas for effective organization of education process;
- 5) designing;
- 6) charting material covering;
- 7) display preparation;
- 8) development (course programming);
- 9) preparation of additional materials (recommendations, manuals, etc.):
- 10) evaluation (including the experimental one) and revision of teaching materials [21].

Concluding consideration of methodological foundation for distance learning course design, we would like to note that generalization of considered theories of education process design and existing approaches to implement design phase of distance learning courses has allowed us defining the stages of the last one: 1) analysis; 2) design. The first stage includes analysis of the target group, expert's activity and tasks, skills and knowledge; defining objective (goals), general education tasks and the tasks to form the expert's activity, etc. Design stage includes the sequence of education, methods, tools and results of education; creation of curriculums, education programs, qualification profile, methodical recommendations,

scripts (education patterns), structure and sequence of education material, test planning, etc.

Our further researches suppose study and generalization of methodological foundation to design distance learning courses.

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Молчанюк В. А.

Аналіз методологічних засад проектування дистанційних курсів

У статті проводиться аналіз існуючих теорій проектування навчального процесу, які працюють незалежно від форми та призначення навчання; розглянуті найбільш поширені підходи до реалізації фази проектування дистанційних курсів.

Автор розглядає понятійно-термінологічний апарат методології, процес здійснення діяльності, проектно-технологічний тип організаційної культури та його основні поняття: «проект», «технологія» та «рефлексія».

Проаналізовані підходи, які використовуються при організації навчальної діяльності, зокрема, при створенні дистанційних курсів: проектування як алгоритм розв'язання винахідницьких задач; педагогічне проектування; система проектування навчання ADDIE тощо.

Ключові слова: дистанційне навчання, дистанційний курс, проектування.

Молчанюк В. А.

Анализ методологических основ проектирования дистанционных курсов

В статье проводится анализ существующих теорий проектирования учебного процесса, которые работают независимо от формы и назначения обучения; рассмотрены наиболее распространенные подходы к реализации фазы проектирования дистанционных курсов.

Автор рассматривает понятийно-терминологический аппарат методологии, процесс осуществления деятельности, проектно-технологический тип организационной культуры и его основные понятия: «проект», «технология» и «рефлексия».

Проанализированы подходы, используемые при организации учебной деятельности, в частности, при создании дистанционных курсов: проектирование как метод решения изобретательских задач; педагогическое проектирование; система проектирования обучения ADDIE и др.

Ключевые слова: дистанционное обучение, дистанционный курс, проектирование.

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