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Technology of creating an adaptive individual scenario of the graduate student's educational activity

Technologia tworzenia indywidualnego scenariusza adaptacyjnego w działalności edukacyjnej magistranta

Abstract

The article, based on the technology development algorithm, represents the technology of creating an adaptive individual scenario of the graduate student's educational activity. The components of adaptive technology have been identified: conceptual, content, procedural-adaptive, resulting. The focus is on the fact that the technology is based on an adaptive approach, the main provisions of which are the concept of directed self-organization, mutual harmonization of diverse impacts on a dialogic basis, self-development, which helps to achieve a common goal in view of external environment requirements and the balance of interests of educational process participants.

The step-by-step strategy of the adaptive educational activity of a graduate student includes a detailed plan of action for the period of training and is implemented through a set of multilevel specific tools, the components of which are given in the article. Furthermore, there have been identified the basic ways of organizing the adaptive activity of graduate students and teachers (technologies, methods, techniques, forms), which are carried out in stages of learning.

Keywords: pedagogical technology, adaptation, adaptive technology, graduate student, educational activity.

Streszczenie

Artykuł przedstawia możliwości rozwoju magistrantów oraz technologię tworzenia indywidualnego scenariusza adaptacyjnego w ich edukacji. Zidentyfikowanymi składnikami technologii adaptacyjnej są: czynnik konceptualny, pojęciowy, procesowo-adaptacyjny i efektywny. Zwrócono uwagę na to, że technologia opiera się na podejściu adaptacyjnym, którego podstawowymi zasadami są koncepcja ukierunkowanej samoorganizacji, wzajemna harmonizacja różnorodnych wpływów z wykorzystaniem dialogu, samorozwój, który pomaga osiągnąć wspólny cel, uwzględniając wymagania zewnętrznego środowiska i równowagę interesów uczestników procesu edukacyjnego.

Strategia „krok po kroku", podjęta przez magistranta w zakresie jego działalności edukacyjnej, zawiera dokładny plan działań na czas nauczania, który jest realizowany poprzez wykorzystanie zestawu wielopoziomowych narzędzi, których elementy przedstawiono w artykule. Zaprezentowano

także podstawowe sposoby organizacji aktywności adaptacyjnej magistrantów i nauczycieli (technologie, metody, techniki, formy) używane na różnych poziomach nauczania.

Słowa kluczowe: technologia pedagogiczna, adaptacja, technologia adaptacyjna, magistrant, działalność edukacyjna.

Articulation of issue

Rapid changes in education stimulate educators to modernize the educational activity of students in higher education institutions. One of the priority areas of higher education is the training of masters capable to respond flexibly to rapid changes in education, to promptly adapt to modern market and educational requirements, as well as to achieve the set goal in constantly changing environment. New opportunities in this area are opened by the author's adaptive technologies, which organize interaction in the "teacher-graduate student" system.

Analysis of recent studies

The development of author's pedagogical technologies has been given considerable attention. The analysis of contemporary scientific works and publications indicates a continuing interest in the specified issue. Thus, the author's pedagogical technologies are proposed by O. Akimova[1], who has successfully implemented the basic idea of the author's technology of active-creative type of learning in higher school, by S. Gubina[2] – the project technology through which each student learns to realize their own abilities and interests, by O. Stoliarenko[3] – the technology of future specialists of social skills of interpersonal interaction on the basis of tolerance, etc. Implementation of ideas of adaptive approach have been embodied in the author's technologies of H. Yelnykova[4] – the technology of adaptive management of educational establishments, O. Zahika[5] – the technology of professional competence formation in future supply agents in vocational schools based on adaptive management,

[1] O.V. Akimova, V.V. Kaplinskyi, V.M. Haluziak, V.A. Sapohov, O.V. Stoliarenko, S.I. Hubina, N.B. Khamska, I.L. Kholkovska, O.V. Shestopaliuk, *Author's pedagogical technologies in the educational environment of the higher school*: Collective monograph, Vinnytsia, TOV "Nilan-LTD", 2015, p. 4.

[2] Ibidem, p. 44.

[3] Ibidem, p. 97.

[4] H.V. Yelnykova, *Adaptive technologies in education* [in:] *Adaptive management: theory and practice*, 2017, vol. 3, no 5.

[5] O.O. Zahika, *Formation of professional competence of future supply agents in vocational schools*, Cand. Ed. sc. abstract, Kiev 2015, p. 121.

V. Luniachek[6] – the technology of professional management training in magistracy for adaptive education quality management, M. Rostoka[7] – the technology of professional competence formation in future accountants for registration of accounting data on adaptive basis, O. Riabova[8] – the pedagogical technology of creative personality formation of the future teacher. Most technology authors aim to optimize the educational process in complex pedagogical environment. However, insufficient attention has been paid to the development of the author's adaptive technologies dealing with the interaction of the teacher with the graduate students in an unstable educational environment.

In view of the relevance of the issue under study, the purpose of the article is to develop a technology of creating an adaptive individual scenario of the graduate student's educational activity.

Statement of basic material

Adaptability in education means the transition to a new level of efficiency and optimality, becomes a dominant characteristic of the teacher's activity, as well as forms the style of modern scientific and practical thinking[9]. It should be noted that the technologies which activate adaptive processes to achieve the initial goal in changing environment, circumstances, and situations are called adaptive. Adaptive technologies, as well as pedagogical ones, contain a certain algorithm for obtaining the intended result, a sequence of pre-designed stages that take place in an unstable educational environment. The technology algorithm is based on an adaptive approach, the main provisions of which are the concept of directed self-organization, developed by H. Yelnykova[10]. Thus, self-direction of subject's actions towards the achievement of a perceived goal implies to the directed self-organization. Through the processes of self-organization, a common goal can be achieved, in view of the

[6] H.V. Yelnykova, O.O. Zahika, H.Yu. Kravchenko, I.S. Lapshyna, H.I. Lukianenko, V.E. Luniachek, H.A. Poliakova, V.S. Ulianova, L.I. Fesik, *Adaptive management of vocational education development*: Collective monograph, Pavlohrad: IMA-pres, 2016, p. 125.

[7] M.L. Rostoka, *Situational modeling technologies in the teaching of accounting disciplines in vocational education institutions* [in:] *Scientific and methodological support of vocational education and training*: Proceedings of the Reporting Scientific and Practical Conference 2014, Kiev 2015, pp. 147–149.

[8] O.B. Riabova, *Theoretical substantiation of pedagogical technology of formation of creative personality of the future teacher* [in:] *Problems of engineering and pedagogical education*, Kharkiv 2013, no 38–39, pp. 159–164.

[9] V.Yu. Strelnikov, I.H. Britchenko, *Modern technologies of education in high school*, Poltava, PUET, 2013.

[10] H.V. Yelnykova, *Scientific bases of adaptive management of general secondary education establishments*, Doctoral Thesis, Kiev 2005, p. 137.

environment requirements and the balance of interests of all educational process participants.

In the course of the study, we have identified the components of adaptive technology: conceptual, content, procedural-adaptive, resulting[11]. Thus, the first component of the algorithm is identifying conceptual provisions of adaptive technology being developed. Conceptualism is identified from the standpoint of optionality and adaptability. Targets and objectives to be achieved and solved by technology, approaches, principles and pedagogical conditions, didactic tasks, etc. have been characterized.

The content component identifies the content of the activity of the educational process participants, its didactic set, fills the adaptive educational environment with the necessary resources in sufficient amount.

The procedural-adaptive component includes the current joint activity of the teacher and the students and the peculiarities of the application of methods, techniques, forms, adequate to the intended objectives. It should be noted that here the variable models of the educational process subjects' activity are created: first, the "initial" background of students, their expertise with the help of selected diagnostic means (for example, qualimetric models) is studied. Then, depending on the results of diagnostics, the further course of work is coordinated by the students themselves, and adequate forms, methods of work are jointly determined to be independently chosen by students. The teacher selects the "initial" diagnostic tools of the educational results. Such steps help to shift the work into a mode of cooperation, to individualize the process of student training, to develop an individual adaptive scenario and to activate directed self-organization and independent activity of students.

The resulting component includes reflection – analysis of the joint activity, analysis of the results obtained, their "initial" measurement, further correction and, if necessary, a step back to the procedural-adaptive level with subsequent joint updating of actions.

Thus, the adaptive technology development algorithm described herein allows maximizing the mechanism of directing the joint activity of students and the teacher to achieve a feasible goal, increasing the extent of freedom between the subjects of educational process, mobilizing them for the desired result. The technological chain of pedagogical actions, operations and communications is arranged strictly in accordance with the targets, have the form of a specific expected result. An organic part of adaptive pedagogical technology is diagnostic procedures containing criteria, indicators and tools for measuring performance.

Description of adaptive technology will be given by the above algorithm.

Technology title: "Technology of creating an adaptive individual scenario of the graduate student's educational activity".

[11] G.K. Selevko, *Educational technologies*, Moscow, NII shkolnyh tehnologij, 2005, p. 87.

Concept of the technology. The current reforms of the national education system cause instability of the educational space, which leads to the search for diverse options for master's vocational training. This requires some changes to the curricula, work programs, etc. Proposed changes are not always positively accepted by those offering educational services (educational establishment, its teaching staff) and those who are to receive them (graduate students).

Traditionally, in the management of the educational process, there has been some authoritarianism, a focus on the communication of ready knowledge, technological insecurity of formation of professional activity, inadequacy of interdisciplinary connections. There is a detachment of the logic of the material learned from the future professional activity, which does not fully meet the modern requirements, in particular to increase its efficiency and limits the possibility to shift to new challenges of society.

This situation causes a certain resonance in the activity of the participants in the educational process (response of the internal structure – the graduate students – to the external stimulus-activator – the teacher). An adaptive process is activated. Teachers and graduate students begin to realize their needs and perform self-organization in this direction. There is a creative search for new information and means of actions based on the analysis of the existing situation, obtaining further information and the adaptation of different requirements.

These adaptations to environmental change and self-organization provide the students' own adaptive educational activity. The peculiarity of this activity is the multilevel nature and the option to be implemented in the educational technology, the ability to adapt to the needs of each student in order to achieve the optimum level of his or her intellectual development. Such adaptation takes place in accordance with the natural abilities and individual inclinations of the graduate students through the development of an individual adaptive scenario.

Targets of the technology are designed to ensure the effective vocational training of masters through self-adaptation and self-organization, with the coordination of the actions of all participants in the educational process.

The objective of the technology is to provide a natural way for the graduate students' development within their own competence and responsibility; to influence the transformation of social purpose into the internal motives of graduate student; to promote the self-direction of the masters' actions to achievement of the feasible goal; to create a bank of multilevel specific tools that will make it possible for graduate students to make the choice appropriate to their individual goals, intellectual development and professional needs.

The proposed technology relies on such leading scientific *approaches* as: systemic, synergistic, adaptive, humanistic, personality-oriented, and differentiated.

Based on the principles of adaptive management, defined by H. Yelnykova[12], we have identified those *principles* that reflect the development and process of organizing

[12] H.V.Yelnykova, *Scientific bases of adaptive management of general secondary education establishments*, Doctoral Thesis, Kiev 2005, p. 114.

educational activity of teachers and graduate students: priority recognition of human development and the determination of the natural way of its implementation; management (of own development process) through self-management; resonance; adaptability; motivation; continuous competence improvement; directed self-organization; cooperatives; joint forecasting of further development by analysis of the result; openness.

It is possible to involve the master in the achievement of goals that are external for him, by raising certain requirements and concurrently creating the conditions for his natural development, which leads to the harmonization of external and internal requirements. Therefore, the pedagogical *conditions* which cause the effective vocational training of graduate students under the individual adaptive scenario are as follows:

– creation of an adaptive educational space (free choice situations due to the developed "set" of behaviors in different possible situations and within a certain range of changes);
– expertise of the teacher (his or her constant improvement of competence, ability to involve additional human resources in the professional sphere (for example, involvement of experts from the business, entrepreneurship, administrators, representatives of local authorities, managers of educational establishments, methodologists, trainers, facilitators, coaches, etc.);
– organization of subject-subject dialogic interaction in the "teacher-student" system, which is aimed at the development and self-development of graduate students, their growth as a professional personality, in view of individual characteristics, interests and abilities.

Improved organization of the process of preparation of undergraduate students in subject-subject dialogic interaction in the system "student-teacher" will be helped by Identified didactic objectives of the technology, the role of which is played by the competences to be mastered by future masters to acquire relevant skills.

Integral skill: graduate students must be able to adapt and self-organize in an unstable environment, independently organize own activity; solve complex problems and challenges in the educational process.

General skills: future masters should be able to: search, develop and analyze information from various sources based on the use of information technologies; act within the legal framework and develop regulatory documents; generate new ideas; self-motivate as well as motivate team members to achieve a specific goal.

Professional (special) skills: graduate students must be able to develop independently, to study throughout life; self-organize in the educational activity: to define the purpose, to carry out long-term and current planning, to self-direct their actions on the implementation of plans, to carry out self-control and self-regulation of their own educational activity; create and organize effective communications in the educational process; to form and demonstrate leadership qualities; to develop projects, manage them, to show initiative and entrepreneurial attitude; carry out self-reflection and correct personal activity as a part of collective activity.

Content of adaptive individual scenario of graduate students' educational activity. The step-by-step strategy of the graduate student's adaptive educational activity includes a detailed plan of action for the period of study and is implemented through a set of multilevel specific tools, which allows varying according to the needs and individual capabilities of the graduate students (Fig. 1).

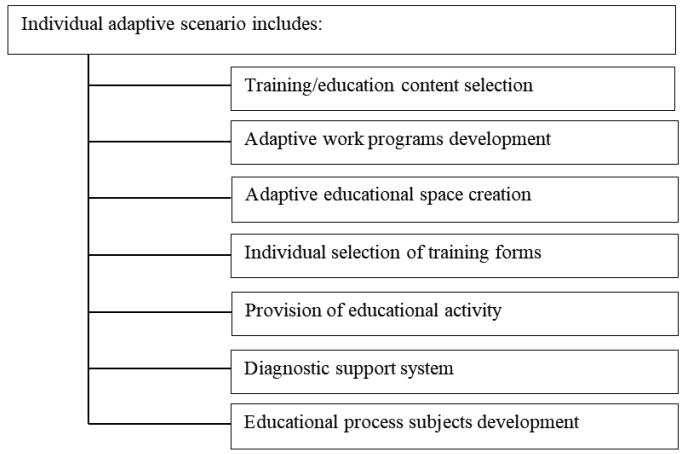

Fig. 1. Components of the individual adaptive scenario of the graduate student's educational activity

Source: own research.

Educational content selection. The teacher determines actual educational material of practical and applied nature, which ensures achievement of the set educational goal.

Adaptive work programs development. The teacher updates the disciplines of the variable component: extends own list of optional subjects, increases the number of hours for mastering practical skills, creates virtual enterprises for students to practice.

Adaptive educational space creation. The teacher fills the educational process with adaptive technologies, techniques, innovative and interactive methods, practice-oriented multilevel tasks, etc.

Individual selection of training forms. Teacher collegially with the graduate student is determines the relevance of the form of training in the study of the themes of the course: full-time or full-time with the option to perform remote tasks and record the results in an electronic journal, distance or full-time with the elements of distance learning, etc. When making the choice, the teacher relies on the individual capabilities, motivation and workload of the graduate student.

Provision of educational activity depends on the availability of a competent teacher who develops methodological, didactic, information and technological support, selects a bank of materials necessary for obtaining qualifications.

Table 1. Organization of adaptive graduate student-teacher interaction

Stages of student learning	**Joint teacher-student activities**		**Activation of adaptive processes**
	Teacher's actions	**Graduate student's actions**	
1	2	3	4
Class work: group work, in pairs or individually (at the student's choice) *Methods:* interactive presentation, brainstorming, storytelling, situation analysis, essays, group problem solving methods, group reflection *Working with distance resources*: chatting, forums, webinars (or video recording) *Methods:* projects, creative tasks, essays			
I – perception of new training information	*Identifying the essence of the subject and phenomena, the formation of needs for learning and motives of educational activity*	*Interpretation, understanding, analysis and synthesis of information, development and deepening of the needs and motives of educational and cognitive activity*	– dialogical adaptation of goals, – transformation of the goal into internal motives of activity through the process of realizing the feasibility of its achievement, – achieving coherence of process participants, – creative process of developing new knowledge
	brainstorming, diagnostics of the "initial" background of the student, defining of a feasible goal together with the students, provision of initial information, facilitation	analysis of available information, independent (in groups, in pairs or individually) selection of scientific information (answering the "big question" on the theme), study of information, display of results of own search for presentation, public presentation	
II – special work on consolidation of training material	*Organization of educational and cognitive activity on mastering training material, creating conditions for accomplishing tasks*	*Updating basic knowledge and skills, initial application of knowledge, mastering skills in standard environment*	– self-organization of activity through directed self-influence, – creation of adaptive activity models through cooperative interaction
	Storytelling, creation of activity models, transfer of degrees of freedom, selection of multilevel practice-oriented tasks by levels: 0 – understanding, 1 – recognition, 2 – reproduction, 3 – application, 4 – creativity, facilitation	selection of rational ways to achieve the goal, choosing and formation of own activity model, independent optional selection of tasks and level of complexity, drafting, analyzing and solving situations	

1	2	3	4
III – mastering training material	*Stimulating and regulating training activity to deepen knowledge and improve practical skills*	*Generalization, systematization of information, application of knowledge in practice with subsequent repetition, creative transfer of knowledge and skills to non-standard environment*	– partnership, – creative process of developing new knowledge and coordination of actions, – selection of additional information and means of action, – cooperative interaction
	creating a virtual practical situation, business game the use of group problem solving methods: the Delphi Method, the 6–6 method (polylogical agreement of thoughts), etc., facilitation	realization of the acquired knowledge in a simulated practical situation and presentation of creative non-standard decisions, working on an essay	
IV – control and regulation of learning and cognitive activity	*Stimulating students to self-control*	*Self-control*	– self-organization of activity through directed self-influence, – ongoing self-analysis and self-correction
	shift from external control, coaching techniques with further identification of students' gaps in knowledge	shift to internal control and self-control, self-assessment of the acquired knowledge, skills, correctness of tasks accomplished, mutual control	
V – evaluation of the results of the training process	*Self-assessment of the results of educational and cognitive activity*	*Self-assessment of the results of educational and cognitive activity*	– joint analysis of qualitative and quantitative changes
	assessment by group or individual testing, stimulating to the analysis of the extent of achievement of the goal	passing a checkup test, self-assessment of own results	
VI – correction of results	*Reflection*	*Self-correction, making adjustments to improve learning and cognitive activity*	– joint identifying of unused reserves and forecasting the ways of further development of students
	using group reflection methods: group discussion, dramatization and playing of own mistakes, etc.	comparison of own results with others, development of self-correction algorithm	

Source: own research.

Diagnostic support system. The teacher carries out monitoring studies for the purpose of current adjustment, using qualimetric models for diagnostics by the "input-output" technique, surveys, questionnaires, tests, etc.

Educational process subjects development. Due to the new conditions of the teacher's work in the process of joint professional activity with the graduate student there is a bilateral improvement of expertise of educational activity subjects due to introduction of new partnership ethics of relations between the teacher and the student, formation of professional competence of students, internships, research work, involvement experts, etc. In this case, there is an ongoing increase in the professional competence of the teacher.

Procedural-adaptive component of the technology. Determination of the subject-subject relationship construct in the "graduate student-teacher" system identifies the basic ways of organizing the adaptive activity of graduate students and teachers (technologies, methods, forms, tools) carried out in the stages of learning (tab. 1).

Resulting component of the technology involves diagnosing the level of skills of graduate students to determine the extent of conformity of the result obtained to the original feasible goal.

Diagnosis is also an integral part of the selection of an individual adaptive master's training scenario. It enables the teacher to obtain strategic and operational-tactical information about the actual status of student's preparation, and for the graduate students to be aware of his/her level, to find out his/her capabilities and jointly with the teacher to develop an adaptive individual scenario of further training.

Conclusion

The proposed technology of creating an adaptive individual scenario of the graduate student's educational activity is dynamic, developed jointly by the teacher and the student, is of an adaptive nature and needs constant updating depending on changes in the educational space. The use of adaptive tools further emphasizes the role of the teacher, which is to develop various practical and creative tasks, to create educational projects and to establish partnerships with graduate students in the organization of their independent work. The application of this technology contributes not only to improving the level of competency of future masters, but also to the current improvement of the expertise of the teacher.

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