INNOVATIVE EDUCATIONAL ENVIRONMENT AS A CONDITION FOR IMPROVING THE TEACHER'S SUBJECT PREPARATION

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Abstract

The relevance of the study is conditioned by the positioning of the teacher's subject preparation as a component of the productive forces. The purpose of the article is to describe the innovative educational environment as a condition for improving the teacher's subject training. The methodological basis of the study was the environmental approach, which considers the environment as a set of many circumstances that ensure the stability of the functioning and development of the object included in it. The main results of the research are to identify the components of the innovative educational environment (content-targeted, organizational-technological, structural-managerial). The study involved 120 teachers and 350 students who identified the criteria for assessing the innovative educational environment (acmeological, competence, innovation). The significance of the results obtained is that the content-objective component causes the inclusion of educational material in the content of education that contributes to the comprehension of subject place in world culture and science. The organizational and technological component includes complex support aimed at improving the level of the teacher's competencies. The structural and managerial component includes the individualization of the teacher's subject preparation. The identified criteria contribute to the integration of education programs, the development of the teacher's professional and qualification potential, and the development of a focus on improving the subject training. In the course of the experiment, an educational quest "Teacher subject" was developed and an algorithm for assessing the quality of teacher's substantive preparation was drawn up.

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Keywords: Educational environment, subject teacher training, teacher education, educational quest.
1. Introduction

The relevance of the study is conditioned by the positioning of pedagogical education as a component of the productive forces, including the teacher's subject training, capable of ensuring the reproduction of competitive personnel and the formation of human capital. The formation of a qualitatively new, postindustrial stage of social progress claimed the development of the economy on an intellectual basis, and not on the material (raw material) economy (Ivanov et al., 2016). One of the properties of the modern economy is its innovative and intellectual nature, which ensures the dynamic development of the state and the high quality of life of the population (Lunev, Pugachova, & Stukolova, 2014a). The main objectives of teacher education were, first, the satisfaction of the individual's need for knowledge, skills, competences (Kozhanova et al., 2016). Secondly, meeting the needs of the economy in improving the training of subject-teachers capable of forming universal (meta-subject) competencies of students, including the skills of building an individual educational trajectory, socially useful activities, tolerant behavior (Pugacheva et al., 2016). The organization of an innovative educational environment can be considered as a condition for improving the teacher's subject training.

1.1. Essence of the educational environment.

The environment can be treated as a set of many circumstances that ensure the stability of the functioning and development of the object included in it. Several points of view on the essence of the educational environment have been clarified. According to the first point of view, the educational environment is a set of circumstances surrounding student, socially valuable, influencing his personal development and contributing to his entry into modern culture (Lunev et al., 2016). In the structure of such an environment, the object-spatial, behavioral, eventual, information-cultural environment is distinguished. The subject-spatial environment of the trainees (arrangement of classrooms, sports grounds, clothes of teachers, the trainees themselves) creates a psychological background on which the relationships of all who are in the school building unfold. Behavioral environment includes the intonations established in the institution in circulation, the nature of the joint activity of trainees and teachers. The event environment is a collection of events that serve as the subject of assessment, an occasion for reflection and a basis for life conclusions. The information environment unites the library, public speeches, conferences. This point of view allows us to say that the process of pedagogization of the environment consists of purposeful pedagogical activity aimed at actualization of socially significant values and needs and deactualization of the values and needs of an antisocial nature in the minds of the trainees (Pugacheva et al., 2016). According to the second point of view, the educational environment is not something unequivocal and pre-determined, the environment begins where certain connections and relations between the subjects of education begin to be built (Askhadullina et al., 2017). In the structure of such an environment, social-contact, informational, somatic, subject parts are distinguished. The social-contact part includes a way of life, activity, and relationships. Information part includes: internal regulations, school regulations, traditions, rules of personal and public safety, orders, instructions, messages, personally addressed impacts. Somatic part is consisted by state of subjects of education. The material part includes the material conditions of education. This point of view allows us to say that the process of environment pedagogization is a resource of development of subject-subject relations (Lunev, Pugacheva & Stukolova, 2014a). We consider the
1. Educational environment as a multidimensional and multifunctional pedagogically organized entity characterized by continuity, processuality, constant renewal of content and acting as an objective condition for the personal development of all subjects of the educational process. The educational environment has a culturally-developing potential, which makes it possible to consider it as a condition for increasing the effectiveness of pedagogical education.

1.2. Structure of the innovative educational environment.

The essence of the innovative educational environment is the actualization of the potentially existing resources to ensure the rapid and effective adaptation of educational programs to the modernization of teacher education and the improvement of the teacher's subject training. In the structure of the innovative educational environment, there are several components: content-purpose, organizational-technological, structural-managerial. It is established that the content-target component determines the inclusion of material in the content of the subject-specific training of the teacher, which ensures awareness of the need for changes in the education system, and the comprehension of the place of the taught subject in world culture and science (Valeeva, & Salyakhova, 2015). The organizational and technological component includes educational-program, scientific-methodical, information and communication support aimed at raising the level of general cultural and professional competencies of the teacher (Shaidullina et al, 2015). The structural and managerial component includes the individualization of packages to improve the teacher's subject preparation and the formation of readiness for innovative pedagogical activity in the teaching process (Lavrentiev et al, 2015; Krylov et al, 2016).

All of the above actualized the problem of organizing of innovative educational environment as a condition for improving the teacher's subject preparation.

2. Problem Statement

The problem of organizing an innovative educational environment as a condition for improving the teacher's subject training attracts increasing attention of scientists (Valeeva, & Khakimova, 2015; Terentyeva et al., 2016). The issues of improving the teacher's subject preparation are regulated by national legislation, as well as the provisions of numerous international competitions for teachers. This makes it possible to single out general and national trends in the teacher's subject training. General trends, conditioned by the provisions of international competitions, are aimed at developing the creative potential of the subject-teacher, the desire for self-development and self-improvement, self-realization. General trends include: providing an opportunity to replenish the teacher's portfolio with a diploma of an international level contestant for obtaining additional points for attestation; presentation and popularization of pedagogical experience of subject-teachers; formation of motivation of subject-teachers for the development of innovative and experimental activities; development of creative potential and increase of professional competence of subject-teachers. If the general trends reflect a strategy for improving the teacher's subject preparation, then national trends, conditioned by national legislation, reflect the methodological tactics of teaching subject-teachers. The Russian trends in the education of subject teachers include: the standardization of pedagogical education; creation of a modern system of continuous education, training and retraining of subject-teachers; the organization of an innovative educational environment as a
condition for improving the teacher's subject preparation (Gutman et al., 2015; Terentyeva et al., 2016; Terentyeva et al., 2017). The study of general and national trends in the teacher's subject training is of great importance, since the strategies and tactics of training of subject-teachers can turn out to be interesting and useful, help to update the content of pedagogical education and improve its quality.

3. Research Questions

Educational quest as a tool for organizing an innovative educational environment. The educational quest is an integrative tool for organizing an innovative educational environment, which combines interactive teaching methods (project, game, research, competitions, debates, exhibitions, presentations) that provides a solution to a set of tasks (increasing motivation for educational and professional activities, developing innovative thinking, optimizing subject-subject relations, the integration of education and upbringing), which requires an unsettled time and free choice of training place.

4. Purpose of the Study

The purpose of the research is to describe the innovative educational environment as a condition for improving the teacher's subject preparation and to identify the instrument for its effective organization.

5. Research Methods

In the process of research, the following methods were used: theoretical (analysis, synthesis, generalization, specification, systematization); sociological (observation, interviews, questionnaires, method of focus groups); pedagogical experiment.

5.1. Experimental research base

The experimental base of the research was the Institute of the Kazan Federal University in the city of Yelabuga (Russia). There were 120 teachers, 350 students participated in the experimental work. Probabilistic target groups of teachers and students were compiled. The group of teachers included professors (middle age of 46 years) and associate professors (average age 35 years), who conduct training sessions with students studying in the field of "Pedagogical Education" and qualifying for 'bachelor' in the profiles: 1) history, legal education; 2) mathematics. The group of students included students of 3-4 courses, studying in the direction of training "Pedagogical Education" and qualifying for "bachelor" in the profiles: 1) history, legal education; 2) mathematics. None of the teachers, students, did not refuse to participate in the experimental work.

5.2. Stages of research

The study was conducted in three stages. At the first stage, the goal is determined, research methods are chosen, the essence of the educational environment and the structure of the innovative educational environment are clarified, and a plan for experimental work is drawn up.

At the second stage, an experimental work was carried out to test the effectiveness of the tool for organizing an innovative educational environment as a condition for improving the teacher's subject training. The experimental work had three stages (stating, forming, control). At the stating stage, with the
help of questionnaires, the attitude of teachers and students towards the organization of an innovative educational environment was clarified as a condition for improving the teacher's subject preparation, criteria for assessing the innovative educational environment (acmeological, competence, and innovation) were determined. The questionnaires included open and closed questions. The results of the survey were discussed in 9 focus groups of teachers, students, each of which included 9 people. The participants were not personally acquainted with each other in the focus group. At the formative stage, the educational quest "Teacher subject" was developed and implemented. At the control stage, an algorithm for assessing the quality of teacher's subject preparation is compiled.

At the third stage of the study, the prospects for studying the problem of organizing an innovative educational environment as conditions for improving the teacher's subject training are determined.

6. Findings

As an instrument for organizing an innovative educational environment for improving the teacher's subject preparation, the educational quest "Teacher subject" combined the participation of students in the activities of the summer intellectual camp for gifted children (13-17 years), meetings of the discussion club "For and against", "Best Lesson Design", "The best pedagogical project", the pedagogical essay "I am a teacher", as well as compiling a coin box of the pedagogical experience "Technological map as a form of education long-term planning" and the pedagogical webinar "The Formation of Universal Learning Activities". Educational quest "Teacher subject" contributed to the solution of the following tasks: expansion of the idea of the integrity of the pedagogical process; the development of pedagogical creativity; understanding of the cognitive and educational value of the academic subject, its place in the education system, world culture and science; integration of pedagogic education programs; the integration of professional and educational standards; the formation in students of a sustainable focus on improving the subject training and the ability for non-standard pedagogical actions, responsibility and independence in decision-making.

6.1. Experimental work on checking the effectiveness of the educational quest "Teacher subject." The stating stage.

At this stage, a survey of teachers and students was conducted and tools for organizing an innovative educational environment were studied. The survey of 120 teachers showed that the organization of an innovative educational environment is facilitated by tools that ensure the development of pedagogical creativity, the development of skills in the search for and implementation of pedagogical innovations: study-cognitive and business games (81%), case study (84%), research method (83%), creating success situations (88%). At the same time, the questionnaires of teachers revealed that most of them do not have sufficient knowledge of integrative tools (portfolios compilation, educational quest) for subject-specific preparation of students (59%). A survey of 350 students showed that educational and cognitive games facilitated organizing an innovative educational environment (81%). At the same time, the survey showed that, most students do not know the methods of modern interactive teaching methods (63%), they find it difficult to determine the place of the academic subject in the formation of universal competencies of
students (69%). Based on the results of the questionnaire, focus group participants identified the criteria for assessing the innovative educational environment (acmeological, competence, innovative).

6.2. Formative stage.

At the formative stage, the educational quest "Teacher subject" was developed and implemented, which combines the participation of students in the activities of the summer intellectual camp for gifted children (13-17 years), meetings of the discussion club "For and against", contests "Best Lesson Development", "Best Pedagogical project", a pedagogical essay "I am a Teacher", and also compiling a coin box of pedagogical experience "Technological map as a form of education long-term planning" and the pedagogical webinar "The Formation of Universal Learning Activities".

110 students took part in the summer intellectual camp for gifted children (13-17 years old) in physics and mathematics in order to gain experience in introducing pedagogical innovations, understanding the place of educational subjects in the education system, world culture and science, mastering the methods of modern interactive teaching methods. The summer camp was created to prepare students for participation in subject Olympiads of various levels; upbringing of interest in deeper study of disciplines of a technical profile and popularization of scientific knowledge. Participation of students in the activities of the camp contributed to the development of innovative thinking, the ability to critically assess the ways and results of activities; acquisition of experience of non-standard pedagogical decisions and formation of readiness for responsibility for the result; increase of motivation for educational and professional activity.

95 students participated in the meetings of the discussion club "For and against". The topic of the discussion is "Research activity contains a reward". The purpose of the discussion was to identify students' attitudes toward innovative pedagogical activity as a factor of sustainable development of the education system, and to determine the place of scientific research in the innovative activity of the subject teacher. Participation of students in the discussion contributed to the development of oratorical skills (to competently construct their speech, to interest listeners, to argue conceptual ideas, to defend their point of view during the discussion); improving the level of general cultural and professional competencies; formation of readiness for innovative pedagogical activity in the teaching process; awareness of the need for changes in the education system.

240 students took part in the competition "The best development of the lesson". The objectives of the competition are: popularization of pedagogical professions in the youth environment, involvement of students in professional pedagogical activity, development of creative potential and increase of professional competence. Evaluation criteria for developments: 1) novelty; 2) the appropriateness of the application; 3) competent and ergonomic design (no spelling errors, quality of technical performance is observed); 4) correctness in the use of copyright materials. Participation of students in the competition was individual and contributed to the comprehension of the place of the taught subject in world culture and science, the development of the ability to substantiate non-standard pedagogical decisions and aspirations for innovative educational practice and personal success.

320 students took part in the contest "The best pedagogical project". The objectives of the competition consisted in the acquisition by students of the experience of introducing pedagogical innovations; formation of skills of setting and solving pedagogical problems with minimization of negative consequences. Criteria for evaluating projects: 1) originality; 2) the appropriateness of the application; 3)
literacy and correctness of registration. The project "Children's University" is of interest. The work of the project is built in the following areas: classes for junior schoolchildren (laboratory and design work in small interest groups); creative thematic competitions (compositions, drawings, poems, etc.); cognitive excursions. Classes do not duplicate the school curriculum. In the "Children's University" is supported and develops in children curiosity, their creative and intellectual giftedness. In an accessible form, students make "scientific discoveries", immersed in a world of numerous riddles and questions. Classes are held once in a month.

Another interesting project was the educational quest "Lessons of the Past" for secondary school students in the general education school. The quest is aimed at familiarizing the students with the history of the city of Yelabuga (Russia). Participants in the quest are divided into teams (8-10 people) who need to pass 4 tests to collect the "keys" before the final contest. During the first test, schoolchildren tried themselves as poets, wrote cinquains, hokku, enclosing rhyme and shape verses. On the second test, the children get acquainted with table etiquette, learned how to serve the table, to use the flatware correctly. At the next test, the teams showed knowledge of history and literature. Needlework was another test for schoolchildren. Girls and boys improved their skills in the ancient technique of origami: from small paper triangles they made a swan. Having received all the "keys", the guys guessed what a test in the finale awaits them in the assembly hall. There they were taught a dance lesson, after which the teams performed one of the most popular and fun dances of the second half of the XIX century - polka. This was the final contest, after which the students received memorable diplomas, and their teacher - a letter of thanks.

Participation of students in the contest "The best pedagogical project" was commanding and contributed to the development of motivation "for success", the disclosure of creativity, the formation of research skills, the development of ways to overcome psychological barriers in the implementation of innovative projects.

350 students took part in the contest of the educational essay "I am a Teacher". This competition allows us to remember with gratitude the teachers who memorized by the students, to comprehend the consequences of pedagogical activity, to realize responsibility for the pedagogical decisions. In the texts of the essay often there are phrases like: "the teacher risked losing respect for students," "pedagogical deed," "pedagogical decision," "the actions of the teacher in this situation were risky." The criteria of the competition included: clarity and consistency of presentation; validity of the author's position.

In compiling a coin box of pedagogical experience "The technological map as a form of perspective planning of the educational process" 280 students participated. A technological map is a visual representation of a program for the long-term development of an object or process. The technological map as a form of long-term planning of the educational process is a program for studying the academic subject, including goals, intra- and intersubject communications, methods of teaching and control, the result that serves as the basis for the preparation of lesson plans. The subject-teacher develops a technological map on his own, based on his creative abilities and qualification, the level of training and abilities of students, and the availability of the learning process with the necessary means of learning. The technological map allows to present the educational process as an integral pedagogical system of training sessions, interrelated on the target, content, activity, control-adjusting and reflexive components. The students collected 142 technological maps of the educational process on history, mathematics. Studying the pedagogical experience of subject-teachers in drawing up technological maps of the educational process has shown that
the basis is modular planning for the study of educational material. Algorithm for modular planning: 1) the training material is divided into modules - logically completed parts; 2) the number of lessons needed to study each module is determined; 3) for each module, the features of the training material are clarified, the basic and additional knowledge, skills, methods of activity that the students must learn are determined; 4) intra- and intersubject communications are established; 5) the methods of learning are determined, taking into account the abilities of students and methods of control.

Studying the pedagogical experience of the subject-teachers in drawing up technological maps has shown that this form of long-term planning of the educational process makes it possible to: 1) maneuver the educational material proceeding from the real rate of its learning, acquiring by the students the skills and methods of cognitive activity, and on this basis to elaborate lessons plans; 2) to manage cognitive activity of students taking into account their real successes, to timely identify the difficulties experienced by students, and to provide them with metered assistance; 3) to develop pedagogical creativity, because organizational issues are resolved in the course of planning, and the planning process itself became creative.

Participation of students in compiling a coin box of pedagogical experience "Technological map as a form of long-term planning of the educational process" contributed to the development of skills to adequately assess their own capabilities; the ability to overcome uncertainty in the process of making a pedagogical decision and to build an individual trajectory of actions.

86 students took part in the pedagogical webinar "Formation of universal educational activities". The purpose of the webinar was to exchange the pedagogical experience of the subject-teachers. Participation of students in the webinar allowed to gain new knowledge on pedagogical innovation, application of Internet resources in teaching; to form an interest in the search for non-standard pedagogical actions.

6.3. Control stage

At the control stage, focus groups conducted an assessment of the innovative educational environment and compiled an algorithm for assessing the quality of the teacher's subject training. The results of the evaluation of the innovative educational environment are presented in Table 01.

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<tr>
<th>Criteria and indicators</th>
<th>Stages of experimental work</th>
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<td>Ascertaining</td>
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<tr>
<td>1. Acmeological</td>
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<td>1.1. Integration of teacher education programs</td>
<td>4</td>
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<td>1.2. Conjunction of professional and educational standards</td>
<td>3</td>
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<tr>
<td>2. Competence</td>
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<td>2.1. Development of the professional potential of future teacher</td>
<td>3</td>
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<tr>
<td>2.2. Development of the ability of future teacher to form universal competencies of students using the means of the academic subject</td>
<td>3</td>
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<tr>
<td>3. Innovative</td>
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<td>3.1. Formation of a sustainable orientation of future teacher to improve the subject training</td>
<td>2</td>
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<tr>
<td>3.2. Formation of students’ ability for non-standard pedagogical actions, responsibility and independence in decision-making</td>
<td>2</td>
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From Table 1 it can be seen that at the control stage of experimental work, all focus groups assessed the innovative educational environment as a condition for improving the teacher's subject preparation by 4 and 5 points. This allows us to say that the educational quest is an effective integrative tool for organizing an innovative educational environment.

In the algorithm for assessing the quality of subject preparation, the focus group teachers contributed: the results of the students' learning achievements in the subject; the results of participation of students in Olympiads and competitions of different levels on the subject; the results of the teacher's work in professional associations of teachers; the results of the teacher's work on improving the subject training.

7. Conclusion

The relevance of the study is conditioned by the positioning of the teacher's subject preparation as a component of the productive forces capable of ensuring the reproduction of competitive personnel. One of the conditions for improving the teacher's subject training is the organization of an innovative educational environment, the essence of which is the actualization of potentially existing resources to ensure the rapid and effective adaptation of educational programs to the modernization of teacher education and the improvement of the teacher's subject training. Structure-forming components of the innovative educational environment: 1) meaningful-purpose, which determines the inclusion in the learning content of educational material that contributes to the comprehension of the place of the subject in world culture and science; 2) organizational and technological, including educational and programmatic, scientific and methodological, information and communication support, aimed at increasing the level of competencies of the teacher; 3) structural and managerial, which includes individualization of subject training and the formation of readiness for innovative pedagogical activity.

The criteria for evaluating the innovative educational environment (acmeological, competence, innovation) contribute to the integration of the programs of pedagogical education, the integration of professional and educational standards, the development of the teacher's professional and qualification potential, the formation of a sustainable focus on improving the subject training and the ability for non-standard pedagogical actions, responsibility and independence in adopting solutions.

It is established that the effectiveness of improving the teacher's substantive training will be improved if an innovative educational environment is organized. This will ensure the actualization of potentially existing resources and the inclusion in the content of the teacher's subject training material on interactive teaching methods that contribute to the solution of a set of tasks and increase the subject progress of students.

In the course of the experiment, the educational quest "Teacher-subject" was developed and implemented, which combines the participation of students in the activities of the summer intellectual camp for gifted children, meetings of the discussion club, pedagogical competitions, compiling a coin box for pedagogical experience "The technological map as a form of long-term planning of the educational process" and the pedagogical webinar “Formation of universal educational actions”. It has been established that the effectiveness of the teacher's substantive training increases on the condition that an innovative educational environment is organized through an educational quest, as an integrative tool that combines interactive teaching methods that ensure the solution of a set of tasks that requires an unconstrained time and free
choice of venue. This contributes to the formation of a sustainable focus on the integration of education and upbringing, the optimization of subject-subject relations.

It is established that the effectiveness of the teacher's subject preparation increases on the condition that the general and national trends in the teaching of subject-teachers are studied. This will allow to compare own programs and methods of subject-teacher training with the experience of others and thereby assess their feasibility and implementation risks.

The results obtained make it possible to outline the prospects for further studies of this problem, which are related to the identification of general and national trends in the education of subject-teachers; identification of effective tools for organizing an innovative educational environment. The materials of the article can be useful for teachers of institutions of vocational pedagogical education; employees of centers of advanced training and retraining of scientific and pedagogical staff of universities and colleges of pedagogical profile.

References


