

IFTE 2019
5th International Forum on Teacher Education
FORMATION OF TEACHER'S CREATIVE COMPETENCIES
FOR INNOVATIVE ACTIVITY

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Abstract

Teachers today work in conditions of rapidly changing education paradigms. This situation requires the teacher to have formed creative competencies for perception, understanding and implementation of innovations in the educational process inspired by new concepts and paradigms of modern education. The teacher who has formed creative competencies from the point of view of modern pedagogical theory is characterized by the following qualities and features: 1) a high level of performance; 2) the desire for a high-quality final result; 3) stress tolerance, ability to overcome difficulties; 4) creative attitude to business, work; 5) the pursuit of professional excellence; 6) the ability to make responsible, sometimes risky decisions; 7) sociability, ability to cooperate, collaborate, create; 8) the ability to quickly learn a new business; 9) the ability to self-education, self-realization, self-development, etc. The teacher's ability to innovate is formed in the education system on the basis of educational, professional, social experience, as well as on the basis of self-education and self-development. Therefore, for the formation of creative competencies the future teacher needs to undergo specially organized training. To form creative competencies of future teachers for innovative activity, we implemented a special course 'Management of pedagogical creativity and innovation in the pedagogical system' aimed at introducing future teachers to the phenomenon of pedagogical creativity and the mechanism for the transformation of pedagogical creativity into innovation; at mastering by graduates of pedagogical universities new organizational forms, technologies and institutional mechanisms to improve the quality of education at all levels.

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Keywords: Creativity, creative process, pedagogical creativity, educational innovation, creative competencies, innovation culture.



1. Introduction

The main goal of our work is to improve the professional and pedagogical training of future specialists in the shadow of the requirements of the teacher's modern working conditions, who must carry out professional activities creatively, based on the introduction of innovative technologies. This is dictated by modern pedagogical realities, by the put forward strategic tasks of updating domestic education, focused on entering it into the world educational space, which, in turn, determines the preparation of the creative personality of a specialist with higher education, able to withstand civilized professional competition not only among domestic professionals, but and in global labor market.

Modern pedagogical science believes that an elementary school student is one of the main participants, the most active self-developing subject of the educational process, for the sake of which the entire learning process in elementary school is created, in which student enters into a subject-subject relationship with the teacher and with the surrounding reality. And the central figure, the backbone of the process of training and education is the elementary school teacher - the carrier of the content of education, the organizer of cognitive activity and comprehensive development, the formation of a modern personality. Therefore, in this part of education, scientifically grounded and organized pedagogical creativity aimed at introducing innovations is especially necessary. As far as is known, pedagogical creativity cannot be realized without specially formed creative competencies of the teacher, and hence innovative activity.

Types, levels of pedagogical creativity and conditions for the creativity of a teacher are disclosed in the works of Zagvyazinsky (1987), Kan-Kalik (1985). The works of a number of authors reflect the mechanisms for implementing innovative educational processes. Among them, it is necessary to name Podymova (1997) others. The work of Smirnov (2007), etc. is devoted to the study of the essence of teacher's innovative activity in the process of training. The development of the social, psychological and pedagogical aspects of the teacher's innovative activity has been given great attention in the works of Petrovsky (1993) and others.

According to our research, the process of formation of teacher's creative competencies for innovative activity in the system of high pedagogical education largely depends on a number of factors and circumstances. We think, that first of all, there is a need to take into account the fact that this process can only be effective if it is preliminarily modeled to organize the training of future primary school teachers, because modeling and then its implementation makes the process of building the competencies of a future elementary school teacher completely organized, manageable, with predictable positive results.

The relevance of solving such a concept led us to the necessity to organize experimental work, which, according to our assumption, was supposed to test and enrich the hypothesis put forward by us, and thereby contribute to the effectiveness of the formation of creative competencies for innovative activities, and subsequently to the formation of an innovative culture of the teacher in the process of professional activity.

2. Problem Statement

A general theoretical foundation has been created in foreign and domestic philosophical, psychological and pedagogical literature for the development of scientific and pedagogical foundations for the formation of creative competencies of teachers for innovative activities of future teachers, the management of this process, the formation of an innovative culture.

Creativity as a phenomenon in human activity (its essence, the mechanism of occurrence and development, functioning) from ancient times has been exciting the greatest minds of mankind. It is safe to say that the theme of creativity in the forms of public consciousness is fully covered. For example, creativity as a phenomenal fact was exposed to understanding from different perspectives: philosophy, psychology, pedagogy, aesthetics, etc. From the point of view of philosophy, creativity is an activity that engenders something qualitatively new that never existed before.

Pedagogy believes that creativity is the highest form of human activity and independent action. Creativity is evaluated by its social significance and originality (novelty).

The foregoing indicates that many problems of the social and natural sciences intersect in the theme of 'creativity'. A wide range of definition 'creativity' is explained by the diversity of human capabilities to transform the world around him and by the existence of various forms of social consciousness. In all these aspects of human activity, manifestations of creativity are inevitable, because human nature is to create and renew everything around him. Creativity, therefore, is the deepest essence of man, separating him from the animal world.

Pedagogical innovative processes have become the subject of a special study of scientists since about the end of the 50s of the XX century in the West and in the last decade in our country. The interest of the world pedagogical community to them is manifested in the creation of special innovative services, publications, magazines, informational publications.

Most studies define innovative processes in education as a certain system, which, actively responding to its challenges of sociocultural reality and not rejecting existing traditions, introduces fundamental changes in the training, education and development of personality. In innovative processes, not only the pedagogical activity itself, its inherent means and mechanisms are transformed, but its goals and value orientations are also substantially rebuilt.

In the psychological and pedagogical literature, the essence, nature, content of innovation are developed quite versatile. For example, it is proposed to carry out a holistic understanding of the concept of 'innovative pedagogical activity' from the perspective of a system-activity approach. This approach allows fully revealing and describing the stages of development of teacher's creative innovative activity: the emergence, development and implementation in practice. On the other hand, innovative activity can also be interpreted as a personal category, as a creative process and the result of creative activity. In system-oriented research, innovative activity is more vividly and professionally revealed in the analysis of the personality, regulatory, communicative and productive subsystems of the creative paradigm.

So, in the scientific and pedagogical literature studies on the training of future teachers for the pedagogical creativity are presented quite fully, but the formation of the teacher's creative competencies for innovative activities is not represented enough. In this regard, it became necessary to generalize the existing theoretical and practical innovative pedagogical experience in the formation of future teacher's

creative competencies for innovative activities in the process of professional activity, to manage this phenomenon in a holistic pedagogical process and to present material for the innovative use of the pedagogical community.

3. Research Questions

Having analyzed the above mentioned scientific sources, the following state of the theme research is identified:

- research on the nature of human creativity has deep historical roots. By the beginning of the 20th century, these studies were embodied in a whole science of creativity, where we can find modern ideas about the essence, nature, laws, forms of manifestation, mechanism, and the process of creativity in their broad and narrow sense;

- the methodology and methods of studying the phenomenon of «creativity» emerged in one historical stream of development of philosophical, aesthetic and psychological sciences;

- the issues of innovation and novelty related to the implementation of teacher's creative competencies also have their development. At the end of the 80s of the XX century, Babansky (1984) emphasized that the creative search for teachers is always associated with the concept of 'innovation'. He focused on the fact that in every innovative search and best practices universal, special and singular should be considered;

- the innovative experience of Russian teachers is summarized in various sources. The most accessible is a kind of anthology compiled by Bazhenova (1990).

4. Purpose of the Study

Identification and justification of a system of specially created pedagogical conditions that ensure the formation of creative competencies for innovative activity of primary school teachers and the implementation of his innovative culture.

5. Research Methods

Students in the field of Pedagogical education (with two training profiles), Primary education and foreign (English) language profile at the Institute of Psychology and Education of the Kazan Federal University took part in our experiment. Research methods: first of all, it is necessary to say about modeling. In our work, we understand pedagogical modeling as a reflection of the characteristics of the existing pedagogical system in a specially created object, which is called the pedagogical model. Moreover, the model is a system that is in some respects similar to the original, in the process of research it replaces the original with respect to the disclosure of the laws of effectiveness, which consists in revealing the dependence of the level of ability and readiness for activity on the type of paradigm (type of training) that is adequate to the stage of educational and professional activities.

Based on the analysis of psychological and pedagogical literature, we determined the four components of the model for the formation of the teacher's creative competencies for innovative activity

and the formation of the innovative culture of the future primary school teacher: targeted, substantive, procedural, evaluative and effective, and presented in Figure 1.

Firstly, the model we presented allows us to cover the entire holistic pedagogical process of forming the teacher's creative competencies in the system. Exactly such model makes it possible to objectively and graphically present the process under study as a system, justify and reveal its internal structure, reflecting the unity of its components, which are interconnected and interdependent.

Secondly, the development of such a model makes it possible to systematize information regarding the process under study, to bring together different ideas about how to optimize the process of forming creative competencies, and, in general, the innovative culture of a future teacher in the process of training.

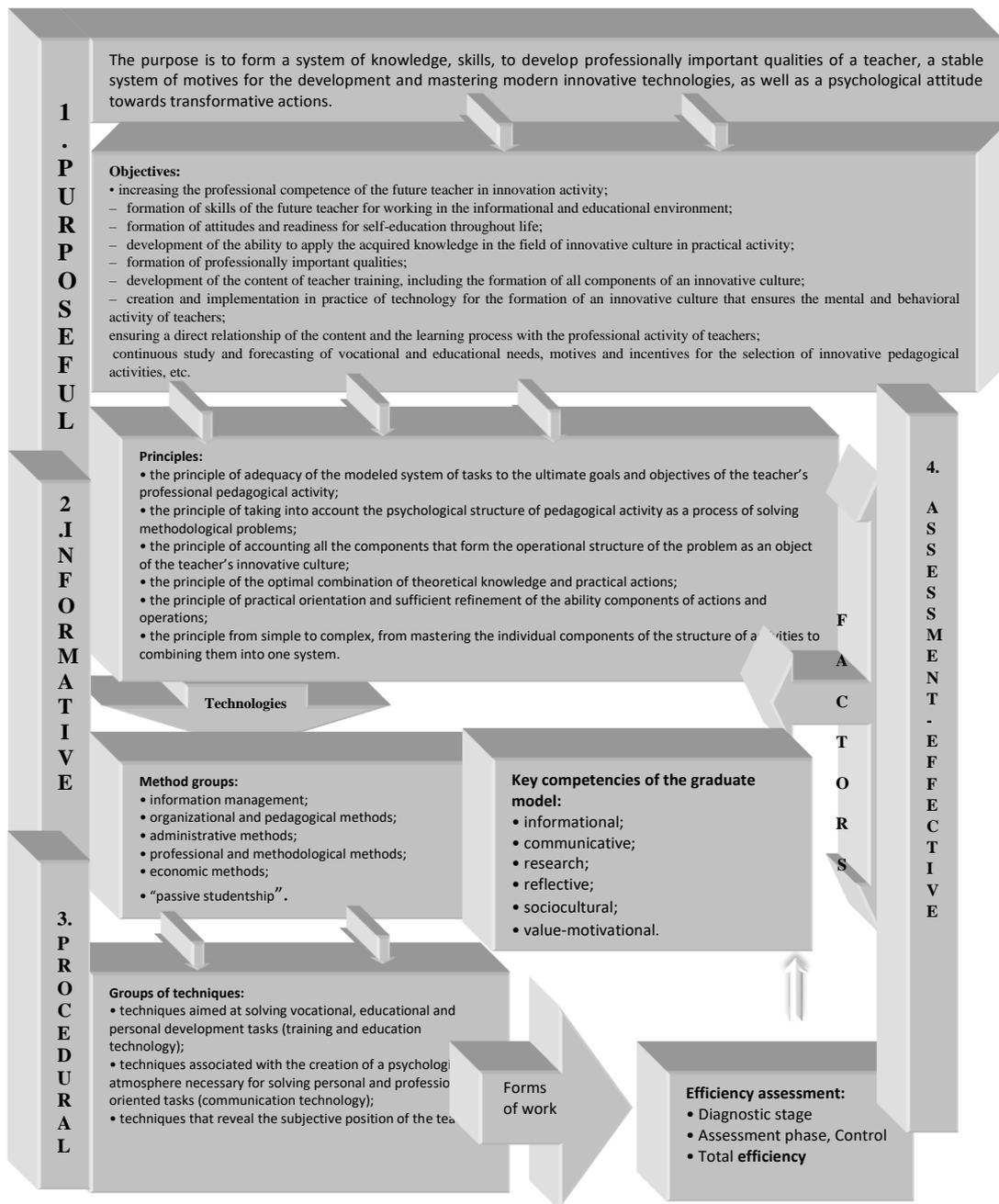


Figure 01. A model of the formation of teacher's innovative culture in the process of training

Table 01. Criteria and levels of formation of creative competencies and innovative culture of primary school teachers

Levels Criteria	Elementary level (low)	Reproductive Level (satisfactory)	Productive level (sufficient)	Creative level (optimal)
Motivational	The teacher does not show interest in the development and implementation of innovative technologies, since he does not consider this important, he has not motives for creative activity and psychological attitudes to innovative activity; he does not show activity in professional self-development.	The teacher is responsible for studying the theoretical issues about innovative activity, but he is not sure that this is important for him in his professional activity; there is no creative activity and its motives do not prevail. Innovative culture is very superficial.	The teacher is interested and responsible for innovative activity in the primary grades. In the system of his motivational sphere there are motives of creative activity, but they are not stable. He irregularly participates in the development and implementation of innovative projects, but does not show due perseverance in case of difficulties.	The teacher is interested in the profession in general and in innovation in particular. The motives of self-improvement and creative activity dominate in his motivational sphere. He regularly participates in the development and implementation of innovative technologies and programs, either as part of a group or individually.
Cognitive	The teacher does not understand the role and importance of innovation in primary school; he does not have sufficient knowledge to solve problems by means of pedagogical innovations.	The teacher poorly understands the role and importance of innovation; he has knowledge sufficient to solve some professional problems.	The teacher understands the role and importance of innovation in the professional activity of a specialist; he has sufficient knowledge to solve professional problems, he is able to describe a simple innovative technology or program.	The teacher understands the role and importance of innovation in professional activity; he is capable to solve complex problems by means of innovation, he is familiar with innovative technologies and programs, including foreign ones.
Reflective	The teacher has a low level of ability of critical analysis, he does not realize	The teacher differentially implements a critical analysis of his own innovative activity and culture, poorly	The teacher understands and realizes the goals and objectives of professional activity, he is capable of	The teacher has a high level of ability to critically analyze innovative activity, he is clearly aware of his own professional

	his own professional actions (goal), his professional self-esteem is inadequate.	understands the goals and objectives of professional activity, has a «polar» professional self-esteem.	unstable critical analysis of his own innovative activity, professional self-esteem is slightly underestimated.	actions (goal), his professional self-esteem is adequate.
Emotional	The teacher experiences negative emotional states in relation to innovation; innovative activity is primarily associated with anxiety.	The teacher is indifferent to innovation; their use only irritates him.	The teacher has a different emotions in relation to innovation, from anxiety to a sense of curiosity; their use causes both interest and anxiety.	The teacher has positive emotions towards innovation; their use causes him a sense of interest, curiosity and satisfaction.
Active	The teacher is not capable of searching and evaluating innovations, including foreign ones, he is not capable of developing and introducing innovations.	The teacher is capable of searching for innovations, but is not ready to evaluate their effectiveness; he is not capable of developing and introducing innovations.	The teacher is capable of searching and evaluating innovations, but is not ready for their use in professional activity, he is capable of developing and implementing the simplest innovations.	The teacher is capable of searching and evaluating innovations, including foreign ones; he is able to develop and implement an innovative technology or program.

The criteria and levels presented in Table 1, for the most part, reflect the levels of formed creative competencies and readiness for the manifestation of an innovative culture of an elementary school teacher. They cover aspects of mastering by a teacher new pedagogical values, new technologies for pedagogical activity, ways of professional interaction with colleagues in the new conditions, a new level of communication and participation in information exchange, and new opportunities for professionally-creative self-realization. The combination of the above criteria reflects the modern system of requirements for the teacher-innovator. In our opinion, underestimating or insufficient formation of any criteria of innovative culture inevitably affects other criteria and ultimately reduces the level of innovative and pedagogical activity of primary school teacher.

Knowing indicators and levels of formation of the future elementary school teacher's innovative culture makes it possible to identify the features of its formation, to adjust the process of formation of each student's creative professional competencies in terms of their readiness to introduce innovations in the future professional activity, to give reasonable recommendations for improving those personality qualities of the future teacher that determine the success of professional activity in the innovative environment of educational institution.

The implementation of our concept was carried out on the basis of a set of methods:

- information and management - implemented in the process of giving information to future teachers about what and how to do, in creating conditions for the assimilation of the necessary information (for example, to invite students to develop (collect) independently or in groups, process and submit a folder with documents defining types of the teacher's activities in the educational institution; to compile diagnostic material to identify the level of acquired knowledge by students; to draw up a set of exercises or tasks for students; to develop a program of the workshop showing possibilities of introducing innovations in the educational process, etc.);
- organizational and pedagogical methods - were implemented through lectures, consultations, explanations, conversations; individual interviews with future teachers (for example, conducting individual and group consultations with future teachers on the choice of an educational institution for the trial implementation of the formed pedagogical competencies; interviews on issues of continuous pedagogical practice, employment after graduation; registration of compulsory socio-pedagogical projects or final course paper, etc.);
- administrative methods - the publication of various documents (regulations, instructions) and bringing their contents to the attention of students (for example, developing and disseminating recommendations and methodological manuals for the preparation of working and educational documentation (reporting), writing final and practical work, conducting diagnostic, educational activities, plans of lesson organization, etc.);
- professional and methodological methods - were carried out through various forms of increasing the level of competence of future teachers in the field of pedagogical skills - these are the study, generalization of the best practices of students, conducting problem seminars, individual consultations that satisfy the educational needs of future teachers (for example, on the following topics: 'Art-pedagogy', 'Organization of research activity of students', 'Professional competitions and participation in them', 'Methodology and methods of compiling the program education and socialization of the class team', 'I and the classroom management', 'Organization of extracurricular activities in an educational institution', 'Sociocultural origins in the system of spiritual and moral education in an educational institution', 'Interaction of school and family during extracurricular time', etc.);
- economic methods - implemented in the process of introducing future teachers to the realization of grant programs; material compensation (bonuses, scholarships) based on the results of work for a semester, year; additional research work (for example, a scholarship of the President of the Russian Federation, a scholarship named after Potanin, a prize for talented youth, foreign scholarships, etc.);
- interactive methods – were implemented through the participation of future teachers in educational internships and interdisciplinary sessions; through participation in conferences of various ranks (the International scientific-practical conference of students, post-graduate students and young scientists called 'Lomonosov', the scientific-practical conference called 'Makarenko Readings', the interregional scientific-practical conference 'Problems of educational and methodical work in educational institutions', etc.).

As methods and techniques that ensure the functioning of this unit, we also chose teaching methods (moderation method, case-study, creative problem-solving method, business games), problem-learning methods.

We used the moderation method when examining educational material in which problems for discussion were involved (for example, when studying the topics 'Designing pedagogical technologies as a form of innovative activity of a teacher', 'Developing and implementing an author's program as a form of innovative activity of a teacher', etc.).

The purpose of the Case-study method was to teach students to analyze information, identify key problems, choose alternative solutions, evaluate them, find the best option and formulate action programs for various problems of social work with different types of family. The practical situations that were offered to students were developed in two ways: artificially constructed and based on a description of real events (most often, events related to the pedagogical practice of students at school).

The 'Business game' method was a complex role-playing game with various, often opposing interests of its participants and the need to make any decision at the end or during the game.

The effectiveness of the implementation of the above mentioned methods was ensured by the use of means of forming the teacher's creative competencies for innovative activities. We divided them into three groups, depending on which technological process they implement:

- a group of tools aimed at solving vocational, educational and personal development tasks (training and education technology);
- a group of tools that are associated with the creation of a psychological atmosphere necessary for solving personal and professionally oriented tasks (communication technology);
- a group of tools that reveal the subjective position of the teacher in relation to professional activity and pedagogical communication.

The last group of actions has an integrative property, as professional pedagogical activity and pedagogical communication exist only due to the presence of a subject (teacher's personality), and their effectiveness depends on the teacher's ability to mobilize his activity, to coordinate it with the requirements for his activity and the level of professional and personal training of graduates.

In recent years, educators have turned to the study of such an unconventional means of pedagogical activity as pedagogical improvisation.

The technology of pedagogical improvisation consists of a series of operations that allow quickly and correctly assessing the situation, making a decision on the basis of the formed competencies with the help of intuition. As you can see, this sequence reflects in general terms the stages of any creative activity. An essential distinguishing feature of pedagogical improvisation is the stage of public implementation of the idea.

So, examples of pedagogical improvisation in our study were deviations from the lesson plan if the teacher noticed a more interesting event around that could attract the attention of children (for example, a sudden non-standard change of weather outside the window (snow in summer), a bright emotional reaction to the event, or assignment of one of the participants in the educational process, incidents or events that happened with class recently or upcoming events). The form of pedagogical improvisation can be any: composition, excursion, task, theatrical activity, etc.

In conclusion, it is necessary to say about some forms of training as ways to implement the procedural unit of the model for the formation of teacher's creative competencies for innovative activities. Lectures, seminars, educational games, extracurricular independent work, students' research activity were actively used in our work:

- lectures (lectures-visualizations, traditional lectures, lectures-discussions), allowing to master the basic concepts of the innovative pedagogical process, to master knowledge of the methods, mechanisms and principles of innovative pedagogical activity;
- practice-oriented seminars, where future teachers got acquainted and studied innovative technologies, techniques and methods of innovative activity, developed innovative projects, watched and discussed videos reflecting innovative forms and methods of working with primary school students, etc.;
- research and educational work of students in schools;
- extracurricular independent work of students involved professional communication with specialists, study of literature, analysis of specific professional situations, solution of practical problems, etc.

6. Findings

Above we called the experimental research bases, in which the sample of experimental work was composed of full-time and part-time students in the field of Pedagogical education, Primary education specialization. Totally 438 students of 4-5 courses took part at the experiment: 216 students of the experimental group (EG) and 222 students of the control group (CG).

The pedagogical experiment was implemented in the process of vocational training at a university. In the control group additional conditions were not created, and in the experimental group a conceptual model for the formation of future elementary school teachers' creative competencies for the innovative activity was implemented.

Our ascertaining experiment in the control and experimental groups showed approximately the same result.

Only a small number of students have a motivational component for pedagogical creativity (on average 2.5% of the total number of participants in the experiment). Most students had elementary and reproductive levels of formation of the motivational component to the study of forms and methods of introducing innovations into their educational and future pedagogical activity.

Most students in the experimental and control groups do not have the need to develop and implement innovative technologies and developed authoring programs in their practice with primary school pupils. In the experimental groups, we found that 89% of students are not ready to conduct their own innovative activity in pedagogical activity and, moreover, evaluate its results.

During the ascertaining experiment, we became aware that some of the students in the control groups are not familiar with the latest researches on pedagogical innovation. Many of them did not search for theoretical and practical materials covering the issues of innovative processes in primary education pedagogy.

At the same time, it turned out that future teachers (21%) want to discuss, would like to acquire competencies in pedagogical innovation. About 10% said that they wanted to meet their educational needs in the process of studying material about innovations in the pedagogical system.

An insignificant part of students, as the study showed, can independently study theoretical material on the problems of innovative pedagogical activity in extracurricular time by means of the Internet.

The findings of a stating experiment convinced us of the correctness of our concept about the need to create special conditions for preparing future teachers at a pedagogical university, to form the creative competencies of a future teacher for innovative activity.

After testing the structural-functional modeling of the formation of the teacher’s creative competencies for innovation, we introduced the special course ‘Management of pedagogical creativity and innovation in the pedagogical system’ into the process of vocational training of primary school teachers.

The special course includes (minimum) 34 hours of lecture work and 26 hours of practice. The course also provides for the independent work of students. The approximate distribution of hours by topic and the content of the topics are presented in table 2.

Table 02. Special course ‘Management of pedagogical creativity and innovation in the pedagogical system’

	Syllabus	Lectures	Practice, seminars
.	The essence and content of human creativity 1. Trends in the historical development of creative research 2. The nature of creativity and the forms of its manifestation 3. Types of creativity. Creativity features 4. Patterns characterizing the creative process	6	1 1 1 1
I	Creativity and pedagogy 1. The essence of pedagogical creativity 2. The content of pedagogical creativity 3. Features and specifics of pedagogical creativity 4. Levels and criteria of pedagogical creativity 5. Functions of pedagogical creativity 6. Methodology and methods for the study of pedagogical creativity	8	2 1 1 1 1 2
I	Pedagogical creativity management 1. Functions of pedagogical creativity management 2. The role of the person in the management of the pedagogical process	4	2 2
V	Pedagogical creativity and innovations at school 1. The essence and content of innovation 2. The innovative potential of the person 3. Types of innovations and their classification 4. Patterns of educational innovation and innovation management in education 5. Pedagogical conditions for improving the preparation of future teachers for innovation 6. Criteria for determining the readiness of a future teacher for future activity	16	2 2 2 2 1 1
	Total	34	26

The special course 'Management of pedagogical creativity and innovation in the pedagogical system' orients the future teacher to pedagogical types of professional activity, its study contributes to the solution of the following tasks of professional activity:

- To determine the nature and essence of pedagogical creativity;
 - Be able to determine the level of their pedagogical creativity;
 - Be able to manage pedagogical creativity in the process of introducing innovations;
- Be able to manage the introduction of innovations in elementary school and identify the results of creative innovation.

A student who has mastered the content of a special course must:

know:

- about the existence of generally accepted ways to study creativity;
- about the ratio of creativity and pedagogy;
- the psychology of the process of pedagogical creativity and its mechanism;
- areas of pedagogical creativity in which innovations are implemented, that pedagogical creativity is a multilevel phenomenon;
- about the existence of criteria for pedagogical creativity;
- about the ways and methods of managing pedagogical creativity;
- about the mutually concurrent nature of pedagogical creativity and innovation;
- about the possibilities of managing pedagogical creativity and innovative processes;
- about the existence of criteria for evaluating innovation and innovative processes in elementary school;

be able to:

- determine the types of creativity, to highlight the starting point of creativity, the essence of the creative pedagogical process, stages, patterns that characterize the creative pedagogical process;
- determine the subject and methods of research of pedagogical creativity;
- highlight the qualities of the creative personality of the teacher and his creative abilities;
- take into account the psychological aspect of the study of creativity and its importance for the pedagogy of creativity;
- manage the psychological mechanism of pedagogical creativity in the implementation of teacher activities;
- apply the criteria of pedagogical creativity to determine the levels of innovative implementations in the practice of the school;
- organize and coordinate the innovation process in the school;
- evaluate the results of innovations and present them to the public;

own skills of:

- managing his own pedagogical creativity;
- introduction of innovative technologies in the school pedagogical system;
- diagnostics (forms, methods and techniques) of the results of one's own pedagogical creativity, and the results of innovative implementations.

After completing the study of the special course (formative experiment), we diagnosed the formation of creative competencies for innovative activity of future teachers. First, we identified the levels of formation of the motivational component (readiness) for the innovative activity of future teachers, which are presented in Table 3.

Table 03. The levels of formation of the motivational component after the formative experiment (% of students)

Level Group	Elementary level (low)	Reproductive Level (satisfactory)	Productive level (sufficient)	Creative level (optimal)
Control group	33,5 (41,1)*	45,9 (46,7)	14,2 (9,4)	6,4 (2,8)
Experimental group	15,7 (42,7)	32,8 (47,0)	34,7 (8,1)	16,8 (2,2)

Comparing numeric indicators it can easily be convinced that the number of students in the experimental group with a productive and creative level of formation of the motivational component for innovative activity (in general, innovative culture) increased. In the control group the changes were not significant.

We analyze the qualitative results. After the formative experiment, the students of the experimental group underwent significant changes in the hierarchy of motives for professional activity – the motives of professional self-development began to dominate, the motive to develop and implement innovative technologies and programs in the practice of working with younger schoolchildren. 63% of students began to read periodicals on various problems of innovation. 64% of students in the experimental group (versus 14% of students in the control group) are ready to discuss professional innovative activities with teachers and analyze various problems of applying innovative technologies. Many students of the experimental group noted their readiness to carry out independent innovation activity - more than 60%. Indifference and episodic curiosity in relation to innovative activity among students of the experimental group was replaced by developing curiosity and functional interest.

Thus, we can explain the quantitative and qualitative changes in the levels of formation of the motivational component for innovative activity among future teachers, first of all, by the completeness of the implementation of the model for the formation of the teacher's creative competencies for innovative activity and the formation of the innovative culture of the future elementary school teacher.

Now let's turn to the analysis of the cognitive component formation level after the implementation of the special course program which is presented in Table 4.

Table 04. The levels of cognitive component formation after the formative experiment (% of students)

Level Group	Elementary level (low)	Reproductive Level (satisfactory)	Productive level (sufficient)	Creative level (optimal)
Control group	33,3 (34,4)	42,8 (47,2)	14,1 (12,5)	9,8 (5,9)
Experimental group	10,8 (36,8)	27,5 (44,3)	40,3 (11,8)	21,4 (7,1)

As we see from the indicators in table 5, the number of students in the experimental group with a productive and creative level of formation of the cognitive component increased significantly.

Most of the students in the experimental group (64%) completed the test tasks. For example, students were absolutely right to describe the steps and stages of the creative innovation process in test assignments; highlighted all the structural components of the innovation process; listed all the factors that

contribute to the emergence of innovations in pedagogical activity; learned to evaluate the innovative potential of pedagogical work. In the control group, no such significant changes occurred.

In our opinion, it is precisely the conduct of purposeful work within the framework of the formative experiment, as well as the introduction of the special course ‘Management of pedagogical creativity and innovations in the pedagogical system’, which led to the fact that students have significantly expanded and deepened their competencies in the field of innovative pedagogical activity, innovative technologies and programs.

Table 5 below shows the results of the levels of formation of the future teachers’ reflective component, the component showing the maturity level of the ability to evaluate the results of their activities, and hence the maturity level of the innovative culture of future teachers.

Table 05. Levels of formation of the reflective component after the formative experiment (% of students)

Level Group	Elementary level (low)	Reproductive Level (satisfactory)	Productive level (sufficient)	Creative level (optimal)
Control group	27,1 (41,4)	46,2 (41,6)	18,3 (13,4)	8,4 (3,6)
Experimental group	19 (40,2)	56,1 (44,1)	27,1 (11,8)	17,6 (3,9)

As can be seen the experimental group students’ level of formation of the reflective component changes in a positive way. As for the control group students, changes are less noticeable. After mastering the content of the special course, the students of the experimental group began to evaluate themselves more adequately, but they could not always evaluate the real level of their own knowledge, skills in the field of innovative pedagogical activity.

Table 6 presents the diagnostic results of the future teachers’ emotional component formation levels, that is maturity for feeling positive emotions towards innovation.

Table 06. Levels of formation of the emotional component after the implementation of the special course (% of students)

Level Group	Elementary level (low)	Reproductive Level (satisfactory)	Productive level (sufficient)	Creative level (optimal)
Control group	20,0 (29,7)	47,3 (48,2)	25,1 (19,0)	7,6 (3,1)
Experimental group	11 (31,2)	46,9 (46,7)	32,7 (18,2)	19,3 (3,9)

The indicators of table 6 objectively demonstrate the fact that, in the experimental group, the number of students with a creative and productive level of formation of the emotional component of readiness for innovative activity has significantly increased. Students of the experimental group significantly decreased the level of professional anxiety. Most of the students in the experimental group have different emotions in relation to innovation, from anxiety to a sense of curiosity; their use also interests them.

Table 7 show diagnostic results of the level of formation of the activity component of readiness for innovative activity among future teachers.

Table 07. Levels of formation of the activity component after the formative experiment (% of students)

Level Group	Elementary level (low)	Reproductive Level (satisfactory)	Productive level (sufficient)	Creative level (optimal)
Control group	33,7 (38,4)	44,3 (46,8)	13,2 (11,2)	8,8 (3,6)
Experimental group	5,6 (43,1)	35,9 (43,1)	36,9 (10,7)	21,6 (3,1)

Table 7 shows us that the experimental group students' level of formation of the activity component changed significantly. Most of the students turned out to be competent in the search and evaluation of innovations, so as in foreign pedagogical systems. They acquired competencies in the development and implementation of innovative technologies in the pedagogical process of the school. Students in the control group also changed indicators, but formally.

We associate such increase in the level of formation of competencies for innovative creative activity among future teachers with the full implementation of the content of the special course in integration with the content of other pedagogical disciplines of the university. The aim of the special course was: to form the teacher's creative competencies for innovative activities; to systematize and generalize knowledge and skills, develop professionally important qualities and personality traits of a teacher, which determine the success of professional activity in the innovative environment of an educational institution; to form a stable system of motives for future teachers to develop and comprehensively introduce innovative technologies and copyright programs in professional activity, as well as the psychological attitude to perform transformative actions and competencies for their implementation in the process of teaching of primary school pupils.

In table 8 we present the results of our diagnostics to compare all stages of the diagnostic work.

Table 08. Levels of formation of teachers' creative competencies for innovative activity and innovative culture before and after the implementation of the special course (% of students)

Criteria	Experimental group				Control group			
	E	R	P	C	E	R	P	C
Motivational	15,7 (42,7)*	32,8 (47,0)	34,7 (8,1)	16,8 (2,2)	33,5 (41,1)	45,9 (46,7)	14,2 (9,4)	6,4 (2,8)
Cognitive	10,8 (36,8)	27,5 (44,3)	40,3 (11,8)	21,4 (7,1)	33,3 (34,4)	42,8 (47,2)	14,1 (12,5)	9,8 (5,9)
Reflective	19 (40,2)	56,1 (44,1)	27,1 (11,8)	17,6 (3,9)	27,1 (41,4)	46,2 (41,6)	18,3 (13,4)	8,4 (3,6)
Emotional	11 (31,2)	46,9 (46,7)	32,7 (18,2)	19,3 (3,9)	20,0 (29,7)	47,3 (48,2)	25,1 (19,0)	7,6 (3,1)
Active	5,6 (43,1)	35,9 (43,1)	36,9 (10,7)	21,6 (3,1)	33,7 (38,4)	44,3 (46,8)	13,2 (11,2)	8,8 (3,6)

*Note: hereinafter the results obtained in a stating experiment are indicated

To prove the statistical reliability of experimental work results, we used the criterion χ^2 . The values of the χ^2 criterion showed the reliability of changes in the number of students with elementary and reproductive (the number of students decreased), productive and creative (the number of students increased) levels of formation of the teacher's creative competencies for innovative activity, and in general, innovative culture. No significant changes in the values of the formation of innovative culture and its components were found among students of the control group. This allows us to declare that the

revealed differences in the experimental and control groups cannot be explained by random reasons, as they are the result of purposeful activities.

Thus, it can be stated that in the experimental group the level of formation of creative competencies for innovative activity and, therefore, an innovative culture in all respects, significantly increased. Students became interested and responsible in relation to innovation in primary school. In the system of motivational sphere there are motives of creative activity, but not all of them are stable. Not regular, but the students of the experimental group began to participate in the development and implementation of innovative projects, although they do not always show due perseverance in case of difficulties. Students of the experimental group began to understand better the role and importance of innovation in the professional activity of primary school teacher; have competencies sufficient to solve professional problems, are able to describe a simple innovative technology or program, can make unstable critical analysis of their own innovative activity, their professional self-esteem is more adequate, they feel different emotions towards innovations, from anxiety to a sense of curiosity, they are capable to search and evaluate innovations, but they are not always ready for their use in professional pedagogical activity.

The data of experimental work indicate that the conceptual model developed and implemented by us has a positive impact on the formation of the teacher's creative competencies for innovative activity.

A statistical analysis of the study results showed that after introduction of the special course 'Management of pedagogical creativity and innovation in the pedagogical system' into the educational process of future teachers, they reached a higher level of formation of creative competencies for innovation.

In turn, the diagnostics of the level of formation of teachers' creative competencies for innovation in the process of professional training at the university confirmed the dynamism of this process, the interconnectedness of all its components, the variability of its formation depending on the individual characteristics of students, as well as the dependence of the level of formation of innovative culture on its initial state and on the content of vocational training during all study at a university.

7. Conclusion

Creative competence of a teacher, as a component of the professional competence of a teacher, is a new concept in pedagogical science. Therefore, in pedagogical theory, there is currently no generally accepted toolkit for monitoring and diagnosing the formed creative competencies for innovative activity among future teachers. Based on a synthesis of existing scientific research, we have developed and applied tools for monitoring and diagnosing the formation of teacher's creative competencies for innovative activity. We presented these competencies in the form of components: motivational, cognitive, reflective, emotional, active, and decide that it is possible to determine the levels of formation of the teacher's creative competencies for innovative activity by evaluating each component that make up these competencies, taking, as a basis, the characteristics of each group of criteria of formation of a primary school teacher's professional competencies.

Thus, the formation of the teacher's creative competencies for innovative activity must be presented as an integral quality of the graduate of a pedagogical university, which includes a complex dynamic system of professionally important qualities and personality traits of a teacher that determine the

success of professional creative activity in the innovative environment of an educational institution, a stable system of motives for development, the integrated implementation of new modern innovative technologies and working programs, and also the psychological orientation to the implementation of transformative action and competence to implement them in the training of primary school pupils.

The program of our study complies with the main stages of the construction and conduct of the experimental educational process. The experimental work had to consist of ascertaining and formative experiments, a control stage. A system of specially created pedagogical conditions that ensure the formation of creative competencies for innovative activity of a primary school teacher and the implementation of his innovative culture we defined as the object of the experimental work.

All above mentioned led to the need to create a conceptual model for the formation of teacher's creative competencies for innovative activity in the process of training. In our opinion, such a model, firstly, makes it possible to objectively and graphically represent the studied experimental educational process as a system, justify and reveal its internal structure, reflecting the unity of its components, which are interconnected and interdependent; secondly, the development of such a model makes it possible to systematize information regarding the process under study, to bring together different ideas about how to optimize the process of forming the teacher's creative competencies for innovative activity in the process of training.

When developing a model for the formation of teacher's creative competencies for innovation, we proceeded from the following scientific attitude: despite the fact that any model is always simplified, functionally inadequate to the simulated object or phenomenon and reflects only their general overview or a likely process scenario, in other words it imitates reality, numerous studies confirm that the modeling method allows you to effectively investigate many processes that are not available to direct observation or experimental replication.

In modeling the process of formation of primary school teacher's creative competencies we followed the methodological instruction, that in the process of theoretical analysis the researcher abstracts from the goals and conditions of each individual act of pedagogical impact, from specific pedagogical situations, from the subjective intentions of the persons involved in the pedagogical activity. He reveals the invariant features of the process as a whole in order to disclose pedagogical laws (Talyzina, 2001).

The theoretical and methodological basis for the development of a model for the formation of teacher's creative competencies for innovative activity was composed of a competency-based approach, a personal-activity approach, an axiological approach, and a contextual approach.

The need to include a competency-based approach in the education system is supported by many well-known educators and psychologists. For example, Zimnaya (2004) notes that nowadays emphasis from the principle of adaptability shift to the principle of competence of educational institution graduates.

Thus, our model of the formation of teacher's creative competencies for innovative activity in the process of professional training is an integrative scientific and theoretical structuring of the process of professional training of students. This process reflects the targeted, substantive, procedural and appraisal-effective blocks. The model reflects the goal, tasks, principles (integrity, the presence of connections between the elements, the ordering of the system, the appropriateness of functioning), functions,

components (motivational, cognitive, reflective, emotional, activity) of the formation of the teacher's creative competencies for innovative activity in the process of training.

An important element of the model is information about the educational environment, factors affecting the effectiveness of the formation of professional competencies of a future teacher.

The model also contains information on diagnostic tools, on evaluation criteria for the effectiveness of the process of forming teacher's creative competencies, contributing to the systematization and generalization of knowledge and skills, the development of professionally important qualities and personality traits of a teacher.

An important component involved in the formation of teacher's creative competencies for innovation is the means of creating teacher's creative competencies for innovation in the process of training. We conditionally divided them into three groups, depending on which technological process they implement:

- a group of tools solving vocational, educational and personal development tasks (training and education technology);
- a group of tools that are connected with the creation of a psychological atmosphere necessary for solving personal and professionally oriented tasks (communication technology);
- a group of tools that reveal the subjective position of the teacher in relation to professional activity and pedagogical communication.

A few words about the forms of training that contributed to the implementation of the process unit of the model for the formation of creative teacher competencies. In our work, this is, first of all, lectures, seminars, educational games, extracurricular independent work, research work of students:

- lectures (lectures-visualizations, traditional lectures, lectures-discussions), allowing to master the basic concepts of the innovative pedagogical process, to master knowledge of the methods, mechanisms and principles of innovative pedagogical activity;
- seminars, where students got acquainted and studied innovative technologies, techniques and methods of innovative activity, developed innovative projects, watched and discussed videos reflecting innovative forms and methods of working with primary school pupils, etc.;
- research and educational work of students at school;
- extracurricular independent work of students involved professional communication with specialists, study of literature, analysis of specific professional situations, solution of practical problems, etc.

In our work, we showed that the teacher's competence in pedagogical creativity is formed on the basis of educational, professional, social experience, as well as on the basis of self-education and self-development. That is why pedagogical creativity is impossible without specially organized training. Such training should take a leading place in the general cultural and professional development of the teacher's personality. The author of this article believes, that this should be one of the priority tasks of the continuing education system, be considered as a special object for modeling the pedagogical system.

The need to introduce a special course 'Management of pedagogical creativity and innovations in the pedagogical system' in the process of training of future specialists is also due to the fact that modern higher education needs fundamentally new innovations that provide universality, fundamental education

and its practical orientation. That is why it is necessary to create mechanisms to overcome the permanent getting left behind of educational systems from the knowledge and technologies on which modern education is based.

We believe that the formation of creative competencies of future teachers for innovative activity, and therefore, the introduction of innovations in the holistic pedagogical process of the university, is a permanent process, passing from the elementary idea of the student about the nature and character of pedagogical creativity to a controlled, self-regulating process, where the subject of creativity, having his own unique experience, creates himself as a person.

Thus, we defined a model for the formation of an innovative culture of a future teacher in the process of professional training at a university, in accordance with the constantly changing conditions of modern society, the dynamics of its social orders. Diagnostic tools that make it possible to comprehensively assess the formation of creative competencies and the levels of innovative culture of primary school teachers were developed. A system of specially created pedagogical conditions that ensure the formation of creative competencies of primary school teachers and the implementation of his innovative culture was experimentally substantiated.

Acknowledgments

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

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