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Studying innovation technologies in modern education

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ABSTRACT

In modern society, innovation technologies expand to almost every field of human activity, including such wide field as education. Due to integrating innovation technologies into the educational process practice, this phenomenon gained special significance within improvement and modernization of the established educational system. Currently, the problem of active integration and wide application of innovation technologies in education is highly significant. Present study explores innovation technologies of learning in the modern education.

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Introduction

Innovation theory in education is a new field of scientific pedagogic knowledge; it is a paradigm of inseparable unity and interconnection of the three main pedagogic processes in the field of education: creation of novelties, their mastering and application. In other words, the subject of innovation theory is the studies of integration of development, mastering and integration of novelties. Innovation theory in education is an innovative process in the educational system, innovative activity, novelty and innovative environment, in which the innovative processes take place. Innovative processes are considered in three main aspects – social-economical, psychological and organizational-regulatory. These aspects define the general climate and conditions, in which innovative processes take place and which either prevent or facilitate the innovative process. Moreover, innovative process does not have a spontaneous nature, but rather it is consciously regulated. Integrating the novelties is a highly significant new function of management.

Innovative activity is nothing but a system of conducted measures for providing innovative process on a certain level of education. Novelties in education present themselves as creative exploration of new ideas and principles, which, in single cases, brings them to becoming typical projects containing the conditions for their adaptation and application. According to the activity types,

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there are pedagogical, supplying and administrative novelties. There are two types of innovative phenomena: pedagogical innovation theory (innovations in the educational system) and innovative learning. While pedagogical innovation theory is related to restructuring and modifying, improving and changing the educational system or its separate parts, characteristics and aspects (creating new legal acts, new structure, models, learning paradigms, forms of integration connections, etc.), innovation learning is defined as a specific type of mastering the knowledge and as a product of conscious, goal-oriented and scientifically-founded activity in the educational process. Innovative learning is currently replacing supporting learning. It is considered to be the educational system's reaction to the society's transition to as higher stage of development and reaction to the changed goals of education. Innovative learning is learning that stimulates innovative changes in the existing culture and social environment. It acts as an active reaction to the problem situations, which appear in front of each single person and the society in general. It is called to prepare not only a "learning person", but also an "acting person". Moreover, all elements of supporting learning are present in the innovative process; the only question is the definition of the proportion between reproductive and productive, active and creative components.

2. Methodology

During the conduction of the study we used the following types of methods: *theoretical* (analysis, synthesis, classification, generalization, deduction, induction, analogy and modelling); *empirical* (observation, survey, questionnaire and interview); *experimental* (stating, developmental and diagnostic experiment); *statistical* (statistical analysis of the data, qualitative and quantitative analysis of the study results).

Methodologic basis of the study consists of modern education frameworks, fundamental statements of higher education pedagogics (Abdulina, 1995; Babanskiy, 1992; Ilina, 2001), theory of professional competencies development (Adolf, 1998; Bespalko, 2004; Kozberg, 2000; Stukalenko et al., 2013), theory of cognitive interest development (Ligay et al., 2015; Ibraeva & Stukalenko, 2014) and theory of professional activity (Ilyasova, 2006; Markova, 1996; Savostyanov, 2007; Stukalenko, 2015). The study also references the governmental documents (The concept of Higher Pedagogical Education of the Republic of Kazakhstan, 2005; The concept of continuous pedagogical education of the teacher of new formation of the Republic of Kazakhstan, 2005; The Law of the Republic of Kazakhstan "About education", 2007), scientific works on the studied problem by national and international researchers, periodic editions of Kazakhstan and other countries, proceedings of scientific and applied conferences, educational programs, educational and methodic books.

3. Results

Analysis of the study problem showed that, in the modern period, innovative changes follow such directions, as: developing new content of education; developing and applying new learning technologies; applying the methods, techniques and tools of learning new programs; creating the conditions for personality self-definition during the learning process; changing the type of activity and style of thinking in both teachers and students, changing their relationships, creating and developing creative innovation teams (in the departments, faculties and in student groups).

Innovative learning is a creative process; it is related to developing and applying exploratory, research, educational-playing, modelling and other types of activity in the educational process. Obviously, solution of the education problems starts from the professional training of the teachers. Because of this, it is highly important that the education of prospective school- and college teachers is based not only on fundamental knowledge in the selected field but also on the general culture, including informational one. Modern teacher has to be able not only to teach his "own" subject, but also be proficient in using innovation technologies and creatively apply them in a specific educational field. In these conditions there is a goal of training not just a teacher, who is able to use new technologies, but a researcher, innovator and experimenter, a personality capable of creative search, critical evaluation of historical pedagogic heritage and adaptation to the modern society and constant changes in the information technologies. It is necessary to prepare a teacher for innovative activity, which includes advanced training in the field of modern technologies, and to develop his readiness for innovative activity in the field of using innovation technologies and for learning in correspondence with the requirements of a modern society.

We understand the innovative activity in the field of new technologies application as integration of the corresponding novelties both in the educational process organization and educational programs, for example, development of programs for universities and innovative educational institutions (gymnasiums, lyceums, experimental sites, etc.). Innovative educational institutions (schools of new type, pre-school and extra-curricular institutions, centers for education and re-education of pedagogic resources, etc.) are actively working in this direction. Because of this, their activity includes the following traits: they develop a model of child's life organization, different from the one in the mass school; they develop fundamentally different from the traditional one educational content, which includes mastering abilities and tools of self-conscience, self-regulation, self-education, self-definition; they conduct the search of a different content of teacher's work, validate new tools and means of his work, which are oriented at developing teacher's creative personality traits and personal responsibility for the content and the results of his work.

Innovative learning is learning that stimulates innovative changes in a corresponding culture and social environment and acts as an active reaction to the problem situations, which appear in front of each single person and the society in general. Innovative learning can be defined as: 1) a specific type of mastering the knowledge, alternative to the traditional normative learning; 2) a process that provides personality development in teacher and students through democratization of the teacher's position and inclusion of everybody in the cooperative creative and productive activity; 3) a change in the nature of educational cooperation, which creates high level of readiness for a certain future and increases the level of intellectual-communicative activity development and creativity; 4) a specific type of mastering the knowledge, which implies the development of students' skills for cooperative actions in new situations.

Furthermore, innovative learning might be considered, firstly, as intentionally constructed learning process based on using scientific and cultural-research knowledge; and secondly, as intentionally organized situation of personality development, which constructs the future and the readiness to fulfill this future (in other words, it is "learning for tomorrow"). Analysis of classification and systematization of the modern learning technologies, proposed in the works of G.K. Selevko and V.S. Kukushkina, and its comparison with another works allowed establishing that technology classification parameters include such characteristics that distinguish them by their level of acquisition, philosophical basis, the main factor of development; by orientation on the personality structures, nature of content and type of regulation; by organizational forms and approach towards a child, by the prevailing method, modernization direction and category of students. Paradigm foundation of any learning technology reflects its main distinguishing traits in didactic and diagnostic positions and organizational-methodic approaches. Because of this, it includes a number of statements and principles of constructing and conducting the educational process in correspondence with the requirements of this technology. Usually, paradigm basis also states the advantage of transitioning from the traditional system to pedagogic technology (Selevko, 1998; Kukushkin, 2004).

In the pedagogic technology the process of goal-setting is the central problem, which is addressed in two aspects: 1) diagnostic goal-setting and objective control of the quality of study material acquisition by the students; 2) personality development in general. In any system, the element of "goal" is system-integrating. A necessary requirement for stating the goals of pedagogic system functioning is their diagnostic ability, i.e. the presence of an objective method for defining the level of reaching these goals. Therefore, learning technology is characterized by the principle of diagnostic goal-orientation in regard to transformation, which means that, in order for a real learning technology to exist, it is necessary to have such goal setting, which would allow objective and definitive control of goal fulfillment level. Because of this, a goal in a learning technology has to be set so precisely and definitively that it would be possible to make an unambiguous conclusion about the level of its fulfillment and to create a rather defined didactic process, which would guarantee its fulfillment in a set timeframe.

For example, the process of goal-setting and controlling education and mentoring in a general-education school in divided in three levels of goal-setting – global, gradual and operative (Bespalko, 1989). The global level of goal-setting includes pedagogic interpretation of social-governmental order and construction of the model of a school graduate's personality. Considering the school's goal of general-education readiness for prospective mastering of professional

education, a school graduate's personality model should reflect such description of personality qualities, which would reflect professional orientation in their preparation for life activities. It is relatively simple to provide diagnostic description of a person's "experience" as a system of proficiency parameters in a certain activity field, which are reflected in the content of the educational subjects. In the level of gradual goal-setting, the global goal differentiates into the main goals according to the stages of training. With the professional orientation of the whole education and mentoring, the object of the educational system's focus becomes a personality model of a professionally-oriented school student, which is divided in the age scale by the main goals in correspondence with the natural gradual process of a school student's personality development. The level of operative goal-setting consists in developing the goal of studying separate educational subjects, which create the content of learning. As experience demonstrates, goal setting has to be diagnostic. It means that there are means and opportunity to check whether the goal has been reached and whether it is operational, i.e. the definition of the goal contacting indications of the means for reaching it.

Any global goal is the sum of several local goals. By definition, local goals are not always diagnostic and operational, because they lead to the development of certain abilities and skills. Local goals can be expanded to transition to the gradual goals. In the general school, there should be two kinds of operational goals – by educational blocks and by separate subjects. Furthermore, developing operational goals by educational blocks promotes close inter-subject link within interconnected subjects. Subjects goals are sub-components of the education blocks goals. Therefore, it is possible to construct hierarchical systems of goals – from global to specific, subject-oriented. Moreover, the closer to the student, the more specific and unambiguous the goals become. Operationally presented local goals are also called tasks. Planning the educational results in the form of system and complex tasks is instrumental presentation of local goals in dynamics. One of the ways of making pedagogic goals more specific is planning the educational results in the form of systems of specific abilities through parts of the task (table 1). The first three abilities - knowledge, comprehension and application – are considered to be low-level, while the next three – analysis, synthesis and comparative evaluation – are higher-level abilities.

Table 1 – Systematization of cognitive affirmations upon pedagogic technologies

Affirmation	Definition	What a student does
Knowledge	Memorization of specific information	Reacts, perceives and recognizes
Comprehension	Comprehension of the proposed material regardless of other material	Explains, translates, shows and interprets
Application	Implication of methods, paradigms, principles and theories in new situations	Solves new problems, demonstrates application of knowledge and constructs
Analysis	Division of information into its constructing elements	Thinks, discovers, lists, discusses and compares
Synthesis	Constructing a whole from separate parts	Combines, constructs, makes up and creates
Comparative evaluation	Definition of materials and methods value with set goals, standards and criterions	Evaluates and discusses

This approach allows solving the problem of multilevel planning of learning results. And diagnostically defined hierarchy of personality development goals in the pedagogic system would allow tracing their actual state and learning processes development on the basis of objective control, as well as consciously improving them. From all the personality qualities, the most researched ones currently are the qualities, which belong to practical experience; this is why they

are more available for diagnostic goal-setting and objective criterial control. Because of this, the development of pedagogic technology is currently possible only for the qualities, which characterize mainly personality's experience.

Intentional activity of a person always fulfills only on the basis of acquiring corresponding information. Moreover, rules and methods of performing the activity are called orientation basis of action. They are the content of learning. Content of any subject is always a certain information about objects, phenomena (processes) or methods of activity. The only difference of educational subjects is the content of their objects, phenomena and methods of activity, although sometimes some educational disciplines can have common objects, which provide complete and sensible activity, including further successful self-education. Objects, phenomena and activity methods, which are listed in the program of an educational subject for studying them, are called by the general concept of "educational elements" (EE). Technologies developers have to strictly reason the need to include each educational element with the learning goals; therefore they have to be easy to review and to be perceived in general and in interconnection. The method of creating a logical structure of the learning content meets this requirement. A sample of goal-oriented analysis of the learning content might become the requirements towards the classification of the information, which a student has to master in accordance with the nature of his work and the functions he fulfills. Depending on these requirements, a minimal amount of EE is selected, which provides successful solution of the tasks that occur in educational activity and everyday life. Analysis of the content of the tasks, which occur during students' mastering of the competencies and which are solved by the means of an educational subject, might be divided into the following components: anticipated results in form of a competence (by educational fields); work and communication operations performed by a student; problems solved by the means of a subject (on the basis of the knowledge from this subject).

There are several classifications of pedagogic technologies by different authors. It is possible to present all pedagogic technologies known to pedagogic science and practice in the most general form and systematize them (Selevko, 1998):

- -by the level of application there are general-pedagogical, specific-methodical (subjective) and local (module) technologies;
- -by the philosophical foundation there are: materialistic and idealistic, dialectical and metaphysical, scientific and religious, humanistic and anti-humanistic, anthroposophical and theosophical, pragmatic and existential technologies; technologies of free mentoring and compulsion;
- -by the leading factor of psychological development there are: biogenic, sociogenic, psychogenic and idealistic technologies; it is currently accepted that a personality is the result of integral influence of biogenic, sociogenic and psychogenic factors but a specific pedagogic technology can consider of them as the main.

Pedagogics does not have such mono-technologies, which use only one single factor, method or principle, because pedagogic technology is always integrative. However, by its focus on one or another side of the learning process a technology becomes recognizable and gets its name from it. According to the scientific paradigm of the experience acquisition, there are associative-reflective, behavioral, developmental technologies, gestalt-technologies and interiorization technologies. This group also includes non-frequent technologies of neurolinguistics programming and suggestive.

By orientation on the personality structures there are: information technologies (developing knowledge, abilities and skills on the subjects); operational (developing the ways of cognitive actions); emotional-creative and emotional-moral (developing the field of aesthetic and moral attitudes); technologies of self-development (developing self-regulating mechanisms of a personality); heuristic (developing creative skills) and applied (developing action-practical field) types of technologies. By the nature of the content and structure there are the following technologies: educating and mentoring, civil and religious, general-educational and professional-oriented, humanitarian and technocratic, various field-specific, as well as mono-technologies, complex (poly-technologies) and integrating technologies. Within the mono-technologies all educational and mentoring process is built upon one certain prioritized and dominating idea, principle or paradigm, while complex technologies combine the elements of different mono-technologies. Technologies, which elements are more frequently included in other technologies and play the part of catalysts and activators, are called integrating technologies.

Modern researchers proposed a classification of pedagogic technologies by the type of organization and regulation of the cognitive activity. Interaction between teacher and student (regulation) can be open-ended (uncontrolled and uncorrected students' activity), cyclic (with control, self-control and mutual control), diffused (frontal) or directed (individual); manual (verbal) or automatized (with educational tools). Combination of these characteristics defines the following types of technologies: 1) classical lecture learning (regulation is open-ended, diffused and manual); 2) learning with audio-visual technical means (regulation is open-ended, diffused and automatized); 3) a "consultant" system (regulation is open-ended, directed and manual); 4) learning with a textbook (regulation is open-ended, directed and automatized), independent work; 5) "small groups" system (regulation is cyclic, directed and manual) – group differentiated ways of learning; 6) computer-based learning (regulation is cyclic, diffused and automatized); 7) a "tutor" system (regulation is cyclic, directed and manual) – individual learning; 8) "programmed learning" (regulation is cyclic, directed and automatized), which has a program constructed in advance.

In practice, there are usually various combinations of these "mono-didactic" systems. The most common of them are:

- -Traditional classroom-lessons system of Ya.A. Komenskiy, which is a combination of lecture type of material presentation and independent work with a book (Komenskiy, 1982);
- -Modern traditional learning, which uses independent work with a book in combination with technical tools;
- -Group- and differentiated ways of learning, in which a teacher has an opportunity to exchange information with the whole group, as well as to focus on single students as a tutor;
- -Programmed learning, which is based on the adaptive program regulation with partial use of all other types.

One of the primarily significant aspects of the pedagogic technology is the student's position in the educational process and adults' attitude towards the students. There are several types of technologies:

- -Authoritarian technologies, in which a teacher is the "single subject" of the educational-mentoring process, while a student is merely an "object"; these technologies have strict organization of the school life, suppress students' initiative and independence and use orders and compulsion;
- -Didactic-centered technologies present a high level of ignorance towards a student's personality; subject-object relationships between teacher and student prevail; education has a priority before mentoring, and the main factors of personality development are considered to be didactic tools;
- -Personality-oriented technologies put a student's personality in the center of all school educational system, along with provision of comfort, conflict-free and safe conditions for its development and actualization of its natural potentials; in this technology, student's personality is the goal of the educational system and not the mean of reaching some unrelated goal (as it happens in authoritarian and didactic-centered technologies); such technologies are also called anthropocentric.

Therefore, personality-oriented technologies are characterized by anthropocentricity, humanistic and psychotherapeutic orientation and have a goal of versatile, free and creative child's development. Within personality-oriented theories there are separate directions, such as humanistic-personality technologies, technologies of cooperation and technologies of free mentoring:

- -Humanistic-personality technologies are primarily recognized by their humanistic essence, psychotherapeutic orientation on personality support and assistance (they state the ideas of complete respect and love for the student, optimistic belief in his creative powers and reject compulsion);
- -Technologies of cooperation actualize democracy, equality and partnership in the subject-subject relationship of teacher and student: teacher and students work in cooperation on setting goals and content and giving evaluations while being in the state of cooperation and co-creation;
- -Technologies of free mentoring focus of providing the students with freedom of choice and independence in his lifestyle: by making a choice, a student has the best way to actualize the position of subject by coming to the result from an internal impulse and not from the external influence;
- -Esoteric technologies are based on the learning of esoteric ("unconscious", subconscious) knowledge – truth and ways, which lead to it; pedagogic process is not translation of information or communication, it is involvement in the truth; in esoteric paradigm, a student becomes the center of informational interaction with the universe.

Means, methods and tools of learning define the names of many existing technologies: dogmatic, reproductive, explanatory-illustrative, programmed learning, problem-based learning, developmental learning, self-developmental learning, dialogical, communicative, game-oriented, creative, etc.

By the category of students there most significant are: mass (traditional) school technology, which is aimed at an average student; technologies of the advanced level (advanced learning of the subjects, gymnasium, lyceum and special education, etc.); technologies of compensating learning (pedagogic correction, support, leveling, etc.); various victimology technologies (surdo-, ortho-, tiflo- and oligophrenopedagocics); technologies for working with deviant (difficult and gifted) children within the mass school.

The names of a big number of modern technologies are defined by the content of those modernizations and modifications, which the existing traditional system undergoes within them.

Mono-didactic technologies are used very rarely. Usually, the educational process is constructed such way that a certain poly-didactic technology is created by integrating a number of elements of various mono-technologies on the basis of a certain high-priority original author's idea. Essentially, combined didactic technology might possess the qualities, which exceed the qualities of each technology that in includes. Usually, combined technology is named after the idea (mono-technology), which characterizes the main modernization and makes the biggest contribution to achieving the learning goals.

V.T. Phomenko proposes a different classification of pedagogic technologies: technology that implies constructing the educational process on the activity basis; technology that implies constructing the educational process on the paradigm basis; technology that implies constructing the educational process on the basis of large blocks; technology that implies constructing the educational process on the anticipating basis; technology that implies constructing the educational process on the problematic basis; technology that implies constructing the educational process on the personality-essential and emotional-psychological basis; technology that implies constructing the educational process on the alternative basis; technology that implies constructing the educational process on the situational, primarily game-oriented, basis; technology that implies constructing the educational process on the dialogical basis; technology that implies constructing the educational process on the mutual basis (cooperative ways of learning); technology that implies constructing the educational process on the algorithm basis; technology that implies constructing the educational process on the programmed basis (Phomenko, 2004). The technologies listed above are tightly linked between each other, and the efficiency of their implication depends on how adequate their choice is for the planned tasks of the education-mentoring process.

Methodology of learning technology resulted in the development of a general strategy of personality development and to the creation of the appropriate means. Therefore, pedagogic technology of learning is a system that consists of a certain diagnostic and operational presentation of the planned results of learning; tools for diagnosing the current state and predicting the tendencies of the students' nearest development; a range of learning models; criterions of choice or construction of an optimal learning model for certain conditions. Learning model is also a system, which includes methods and organizational forms of leaning, combined in its didactic basis, and pedagogic technique that includes means and tools. The choice of organizational forms of learning is also defined by certain and logical connections of the elements in a pedagogic system. Using these connections and finding the optimal organizational forms helps to overcome the formality in this pedagogic system element, especially if the organizational forms of learning are interpreted untraditionally – as a necessary beginning of the didactic process and not as a non-essential condition for its functioning.

Transition to any learning technologies starts from the choice of a model of learning on the basis of the optimality criterions of this model. A learning model is adequately defined by the study program and textbooks, which are thoroughly analyzed for establishing their efficiency. Criterial approach in choosing a learning model, study programs and textbooks is their consistency in efficiency, achievement of the planned results of learning (minimal mandatory level), diagnostic content of learning and predictive capacities of development. A distinguishing trait of any learning technology is its systematic nature, structural-content integrity, tendency to change and simplicity

to regulate the educational process. Because of this, a teacher has to constantly account for the principles of integrity in constructing and using a learning technology and act according to them.

After the preliminary choice of a learning model consistent with the subject, a teacher reaches the construction of the didactic parameters of learning, such as methods and organizational form of learning. Pedagogic technique of learning primarily includes learning tools, starting from using computers and other technical means, and up to hand-out tasks of different levels for evaluating the levels of acquisition of the taught material and introduction of the necessary correction.

Learning technology is an applied and practical continuation of the general didactics. Any interested teacher can master the scientific-methodic basis of the learning technology, choose an adequate model for it and construct a lesson project. Generalized model of the gradual approach to education with the use of a certain pedagogic technology includes the following stages:

1st stage: definition of the learning content, its further detailed distribution by the models and gradual planning; a teacher has to consider the logical model and study elements, which correspond with goals and tasks of each lesson;

2nd stage: calculation of study time necessary for acquiring the planned content, consideration of the load on a student and choice of optimal proportion of the load and study time;

3rd stage: choice of the organizational model of learning, its efficiency and intensity; creation of the list of technical and other learning tools, which has to be described and reflected in the general education process project;

4th stage: preparation of study materials has to be conducted such way that they correspond with the planned results of learning and were constructed in the motivational mode; study texts for various situations are different from each other;

6th stage: preparation of homework with consideration of mandatory (minimal) and basic (algorithmic, heuristic and creative) levels of academic progress;

7th stage: preparation of specific-correctional questions on the new topics of the learning content.

The presented stages demonstrate gradual transition to learning with the use of a certain pedagogic technology.

Another significant part of theoretical-pedagogic aspect of training prospective teachers in a pedagogic college consists of pedagogic works and studies on the topic of higher school pedagogics, which address the questions of modelling teacher's pedagogic activity and its functional structure, development of teacher's personality, perfecting teacher's skills and development of a system of general-pedagogic knowledge, abilities and skills of educational-mentoring work with children (Babanskiy, 1992; Kuzmina, 1990).

Job description of a teacher contains the content specifics and the structure of a teacher's activity, innovation technology of his training with regard to goals and tasks of learning this subject in college; it also contains a system of requirements towards a teacher's personality, his knowledge, professional skills and abilities, which are necessary for successful performance of multifunctional pedagogic activity. Analysis of the national and international literature about professionally-oriented education of prospective teachers provides the evidence for stating that the studies of this problem can be divided into two main directions. The first one is related to the analysis of the general questions of theory and practice of professional orientation, particularly the main aspects in teacher's education, structure and content of teachers' professional activity, teacher's personality and his role in the education process (Klarin, 1999; Bogoyavlenskaya, 1991; Skatkin, 1995). The second direction addresses the questions of independent work and self-education as one of the components of a teacher's professional activity, as well as the development of corresponding professional abilities during the class work (Bashirova, 2003; Gershunskiy, 1997; Kenzhebekov, 2002).

Analysis of the works that explore such significant questions as the content of concepts of "professionally-oriented learning", "innovation technologies", education of teachers, functions, levels and abilities of teachers' professional activity, stages of its mastering, and finally, criterions

of its evaluation, revealed an opinion that teacher evaluation is an integration of functional actions (stimulating, reacting, controlling, etc.), which are aimed at solving communicative tasks. Pedagogic communication on a lesson is consequently reduced to stimulating, controlling and organizing students' activity. A significant aspect in the method of teaching the professional abilities to master the learning process are the efforts to define the component content of the stages of its construction and to develop a structural model, which are presented as a complex-structured "integral ability". First of all, it is necessary to point out that there are no fundamental objections to such understanding of this professional ability. Pedagogical innovation theory studies the question of the proportion of the learning component preparation in its content, because this criterion allows evaluating the pedagogic technologies of communicative-teaching ability rather objectively. Undoubtedly, studies of the problem of educating prospective teachers helped solving the tasks of making the learning process more pedagogic. However, it is necessary to admit that both professional proficiency as a goal of educating a specialist for schools and colleges and the activity structure, along with a system of corresponding abilities providing the pedagogic process efficiency, have not yet become the subject of thorough analysis.

Recently, researchers and methodic scientists relate the opportunities for improving teachers' professional training and their proficiency in using new innovation pedagogic approaches with the need of expanding the prospective teacher's knowledge about the nature and structure of activity and developing special abilities, which provide its efficiency (Lukyanova, 2001; Raven, 2002). It can be explained by the following.

Firstly, it is because of insufficient level of teachers' proficiency of the new technologies in order to organize and regulate the process of pedagogic communication at a lesson. Observing teaching activity of the prospective teachers, trainees and teachers-interns during the teaching of innovation technologies shows that graduates and interns have the necessary abilities, but they are absolutely not sufficient as a component of professional knowledge of the bases of innovative activity. Generally, it is logical, because developing the aforementioned abilities is conducted outside of the conditions of professionally-oriented learning and without consideration of the teacher's prospective activity's needs. As a result, teacher's pedagogic and diagnostic-communicative level is so low that it does not allow him efficiently regulating students' communicative-cognitive activity at a lesson and making the necessary corrections to the content and structure of the learning process with the new pedagogic technologies.

Secondly, it is the absence of principles and vivid representation of the goals of professional-pedagogic orientation. In order to provide this professional orientation for teachers' education, it is necessary to develop the content of the professional component of the education process itself. Probably, this component has to include the following: functional model of a teacher's professional activity with the implementation of the pedagogic technology, projected on the educational-mentoring process in a pedagogic college; the necessary level of psychological and motivational readiness for performing the prospective professional activity; the main aspects of professional knowledge of the new technologies of the prospective teachers; content of the elective preparation courses at the pedagogic college departments; means and methods of innovative technologies, as well as a system of organizational forms of learning the professional abilities; conditions that provide the efficiency of prospective teachers' mastering of the professional abilities.

Thirdly, it is the indetermination of the teacher's information as a mean for providing pedagogic learning at the lesson with the implementation of the corresponding educational innovation technologies.

Therefore, the tasks of professional training of the prospective school teacher for applying the educational innovation technologies in their practical activity is defined by this study from the two significant problems: a) studying new pedagogic technologies as an active educational process, providing the teacher with the knowledge about patterns, principles and content of its main aspects; b) developing a system of teacher's professional preparation for this process.

4. Discussion

Present study was conducted by a group of authors, who created an extensive experimental site based in Kokshetau State University of Sh. Ualikhanov. The results of the conducted study were

discussed during the meetings of those departments, the scientific seminar “Actual problems of psychological and pedagogic science and modern education” and on the international scientific and practical conferences: “Valikhanov’s readings”, “Current problems of contemporary education and pedagogic specialists training” in Kazakhstan (Kokshetau, Astana), “Introducing new educational technologies and principles of educational process organization” (Singapore), “Modern education: problems and solutions” (Bangkok, Thailand), “Innovative technologies in higher and professional education” (Majorca, Spain), “Education and Science without Borders” (Munich, Germany), “Actual Problems of Education. Experience of Realization of Bologna Agreements” (Amsterdam, Netherlands), “Current problems of science and education” (Moscow, Russia), “Problems of international integration of national education standards” (Paris, France). The generalized results of the conducted study are being published for the first time.

5. Conclusion

The results of the conducted study allowed making the following conclusions:

In general, socially-defined need in increasing pedagogic orientation in the prospective teachers’ education in a pedagogic college creates the following problems:

1) the problem of constructing professionally-oriented educational process for the prospective teachers as a system of constantly complicating tasks and corresponding situations;
2) the problem of increasing the quality of professional training and independence of a prospective teacher during construction and application of innovation technologies;
3) the problem of specifying this component of the professional education of a prospective teacher, who plans and performs the process of developing his own abilities to use the pedagogic technologies in his practical activity.

As the exploration of this problem within the conducted study has shown, the solution of the defined problems is slowed down particularly by the absence of the developed theoretical and methodical bases of prospective teachers’ professional preparation for using educational innovation technologies. In our opinion, there is a certain dependence of the level of practical mastering of knowledge and abilities to organize school educational-mentoring process on a technological basis from the efficiency of professional-communicative proficiency in the pedagogic colleges’ graduates. The conducted analysis of the works on the method of teaching at the pedagogic departments, experience of teaching in a pedagogic college and observations of trainees, interns and teachers demonstrates that the problem of teachers’ professional training for using educational innovation technologies is not presented as urgent, whereas it remains insufficiently studied and controversial both on theoretical and practical levels. The issue of improving teachers’ educational activity on the basis of the innovative approaches, its structure and content of the corresponding abilities, which supply it, remains open.

The process of educating teachers to apply innovation pedagogic technologies as an object of theoretical studies is also not studied enough, and therefore, does not have an integral theory. One might think this fact is also one of the reasons for insufficient level of mastering professional knowledge, abilities and skills of using educational novelties in general-education schools teachers. Now it is obvious that in the problem of improving teachers’ professional training it is necessary to focus on the idea of the approach based on studying and integrating new educational technologies. Currently, graduates of the pedagogic specialties in colleges are not prepared enough, both psychologically and professionally, for innovative educational activity in school. Because of this, it is necessary to develop a new approach to teaching proficiency in the prospective teachers in advance. This approach has to consider, first of all, specifics of the development and preparation of a teacher's activity and corresponding abilities providing it. It is necessary to say that these problems are currently not being studied enough; despite that, they are highly significant because their exploration would help creating an integral picture of the specifics of a teacher’s educational activity, and consequently, optimizing the process of professional training in the system of pedagogic education. In order to understand the logic and tasks of the study, we would like to point out that we consider the most significant knowledge in training the prospective school teachers the following: mastering new teaching techniques; professional abilities to organize and regulate innovation educational processes; knowledge of the main forms of teacher’s innovation activity. Insufficient knowledge about these and other problems of teachers’ professional preparation for using innovation pedagogic technologies slows down the improvement of teachers’ professional preparation in general. It can be explained by the complexity of these questions and

the problem in general, as well as by the ignorance of the significance of the aforementioned aspects in teachers' professional preparation.

Therefore, ambiguity of many problems of teachers' professional preparation for using innovation pedagogic technologies in teaching the students and of the definition of teachers' innovation activity per se, flaws of college education, absence of a theory and system of professional-technological preparation in pedagogic colleges and emerged need in developing a new approach in teachers' education define scientific significance of present study. Development of theoretical and practical aspects of teachers' professional preparation for using innovation pedagogic technologies would not only facilitate the improvement of teachers' pedagogic proficiency, but would also have a direct positive influence on improving the educational process in a modern general-education school. Combination of the facts presented above defines the perspective of studying this problem, which has theoretical and practical significance.

Disclosure statement

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References

Abdulina, O. (1995). Actual problems of pedagogical education. Journal of Higher School of Kazakhstan, 5, 58-63.

Adolf, V. (1998). Theoretical bases of formation of professional competence of teachers. Moscow: Nauka, 344.

Babanskiy, Yu. (1992). Competence model: from the idea to the educational program. Moscow: Nauka, 366.

Bashirova, Zh. (2003). Pedagogical competence of teachers in higher education. Higher education today. 11, 21-27.

Bespalko, V. (2004). Competences in the professional education. Higher education today, 11, 56-62.

Bespalko, V.P. (1989). The components of pedagogical technologies. Moscow: Enlightenment, 215.

Bogoyavlenskaya, D. (1991). Formirovanie pedagogicheskikh sposobnostey. [Development of pedagogic skills]. M.: Pedagogika, 124. .

Gershunskiy, B. (1997). Philosophy of Education for the XXI Century. Moscow: Nauka, 365.

Ibraeva, I., Stukalenko, N. (2014). O razvitii poznavatelnoy aktivnosti buduschikh pedagogov. [On the development of cognitive activity in the prospective teachers]. International journal of experimental education, 8, 56-57, http://www.rae.ru.

Ilina, T. (2001). Fundamentals of teachers` professional competence. Management in Education, 1, 166-171.

Ilyasova, K. (2006). Introduction to teaching activities. Almaty: Kazakhstan, 225.

Kenzhebekov, B. (2002). The nature and structure of professional competence of a specialist. Higher School of Kazakhstan, 2, 171-175.

Klarin, M.V. (1999). Technologies of teaching: the ideal and reality. Riga: Vesta, 180.

Komenskiy, Ya.A. (1982). Selected pedagogical works. Moscow: Pedagogics, 1, 174.

Kozberg, G. (2000). Formation of professional competence of the teacher in the teaching activities. Voronezh: Znaniye, 242.

Kukushin, V.S. (2004). Pedagogical technologies. Moscow: March, 335.

Kuzmina, N. (1990). The professionalism of a teacher`s personality. Moscow: Nauka, 232.

Ligay, M., Ermekova, Zh., Stukalenko, N. (2015). Vazheyshie prioritety obrazovatelnoy politiki respubliki Kazakhstan i vozmozhnye puti ikh realizatsii. [The most significant priorities in educational policy of the Republic of Kazakhstan and possible ways of their actualization]. International journal of experimental education, 11, 715-718, http://www.rae.ru.

Lukyanova, M. (2001). Psycho-pedagogical competence of the teacher. Moscow: Pedagogics, 178.

Phomenko, V.T. (2004). Creative technologies as an important reserve for increasing the effectiveness of teaching. Poisk, 4, 160-164.

Raven, D. (2002). Competence in modern society: the identification, development and realization. Moscow: Nauka, 424.

Savostyanov, A. (2007). Basis of the professional and personal growth. Moscow: Nauka, 144.

Selevko, G.K. (1998). Modern educational technologies. Moscow: Public education, 253.

Skatkin, M. (1995). Professionalno-pedagogicheskaya podgotovka studentov. [Professional pedagogic preparation of students]. Pedagogika, 2, 42-47.

Stukalenko, N. (2015). About innovative development of university education in the Bologna process. International Journal of Applied and Fundamental Research, http://www.science-sd.com/461-24834.

Stukalenko, N., Ermekova, Zh., Tasbulatova, G., Kalymova A., Kainikenova, G. (2013). Formation of future teachers' professional skills during the period of pedagogical practice. Life Science Journal, 12s, 139-141, http://www.lifesciencesite.com.

The concept of continuous pedagogical education of the teacher of new formation of the Republic of Kazakhstan. (2005). Astana: Adilet.

The concept of Higher Pedagogical Education of the Republic of Kazakhstan. (2005). Astana: Adilet.

The Law of the Republic of Kazakhstan “About education” of 27.07. 2007 No. 319-III.

Markova, A. (1996). Psychology of professionalism. Moscow: Publisher Prospect, 308.