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Studying innovation technologies in modern education

Nina M. Stukalenko[a], Bariya B. Zhakhina[a], Asiya K. Kukubaeva[a], Nurgul K. Smagulova, Gulden K. Kazhibaeva[a]

[a]Kokshetau State University of Sh. Ualikhanov, KAZAKHSTAN

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.

1. 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

CORRESPONDENCE Nina M. Stukalenko ✉ Email: nms.nina@mail.ru

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, 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.No potential conflict of interest was reported by the authors.

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