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Structural conceptual model of forming readiness for innovative activity of future teachers in general education school

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Abstract

Modernization of higher vocational education requires a significant rethinking of the structure and concept of the educational process in a HEI. One of the vocational training directions should be the formation of future teacher's readiness to innovate activity, which would allow teachers to demonstrate their individual creative abilities, realize their intellectual potential, and apply the full range of knowledge, skills and experience acquired in the process of studying at hei. Creation of optimal organizational and pedagogical conditions for personal self-realization is an actual task for all levels in education, but for higher vocational education this task acquires special connotation and significance.

Keywords: structural conceptual model, future teacher, innovative activity.

Modelo conceptual estructural de preparación para la actividad innovadora de los futuros maestros en la escuela de educación general

Resumen

La modernización de la educación profesional superior requiere un replanteamiento significativo de la estructura y el concepto del proceso educativo en un HEI (IEU). Una de las direcciones de la formación profesional debería ser la formación de la futura preparación del docente para innovar, lo que permitiría a los docentes demostrar sus capacidades creativas individuales, realizar su potencial intelectual y aplicar toda la gama de conocimientos, habilidades y experiencia adquirida en el proceso de formación estudiando en HEI (IEU). La creación de condiciones organizativas y pedagógicas óptimas para la autorrealización personal es una tarea real para todos los niveles en la educación, pero para la educación vocacional superior esta tarea adquiere connotación y significación especial.

Palabras clave: modelo conceptual estructural, futuro docente, actividad innovadora.

1. INTRODUCTION

Participation of Kazakhstan in the bologna process (in March 2010, Kazakhstan became the 46th country participating in the bologna process) opened the way to European education, giving an opportunity to improve the quality of education, mobility of students and teachers. The system of mutual influence of higher education in the European space is a priority direction of education reformation in our country. The state program for

the development of education of the republic of Kazakhstan for 2011-2020 shows specific directions for development in this area (NABI, et al., 2016). Modernization of higher vocational education requires a significant rethinking of structure and concept of educational process in a hei. One of the vocational training directions should be the formation of future teacher's readiness to innovate activity, which would allow teachers to fully demonstrate their individual creative abilities, realize their intellectual potential, and apply the full range of knowledge, skills and experience acquired in the process of studying at hei. Creation of optimal organizational and pedagogical conditions for personal self-realization is an actual task of all levels in education, but for this higher vocational education this task acquires special connotation and significance. It is not enough for a modern teacher to have deep knowledge in the field of studied disciplines and to possess a certain set of practical skills. The fulfillment of professional tasks presupposes a creative approach to the tasks, organization of professional activity aimed at rational transformation of reality. Thus, the formation of future teacher's readiness to innovate activity in the process of vocational training is one of the topical areas of the modern educational process (TYUNNIKOV, 2016). At the same time, the complexity and versatility of the innovation theory etiology leads to the introduction of many scientific approaches to its study in different fields of knowledge. The theory and practice of higher education today shows that, despite the ongoing reforms in the system of higher education and the intensification of research on various aspects of pedagogical innovations, the problem of organizing a purposeful process as one system for forming future teachers' readiness to innovation activity is still present (KAMALOVA and ZAKIROVA, 2015). Today, there is a certain contradiction between social procurement of the society for the

formation of a comprehensively developed, socially active personality of a graduate in regular school through comprehensive introduction of pedagogical innovation ideas that ensure the effectiveness of educational process and the actual level of future teacher's readiness to performing professional functions, which is pedagogical innovation. One of the most relevant aspects for the work of her is the development of theoretical, methodological and technological problems in the formation of the future teacher innovative abilities in the context of integration into the global educational space.

2. METHODOLOGY

Regarding to the main goal of the research, the research method was descriptive and correlational, which was conducted field experiment. The statistical population of this study was all experts, directors and deputies of the General Directorate with 102 people. Due to the limited research community, the sample was considered equal to the community ($n = 102$). The predictor variables in this research were organizational culture (engagement, integration, adaptability, and mission) and criterion variable or organizational entrepreneurship criterion. Three organizational questionnaire, organizational entrepreneurship and individual characteristics were used to collect data. The organizational culture questionnaire of Denison (2007), with a reliability coefficient (0.955%), was used to collect information about the study of organizational culture. Descriptive statistics (frequencies, averages, percentages, standards deviations, and charts and tables) were used for organizing, summarizing, categorizing raw scores and describing the indices of research variables.

The following methods were used during the research: theoretical (analysis, synthesis, specification, generalization, analogue method, and modeling); diagnostic (questioning, interviewing, testing, method of tasks); empirical (study of the educational organizations experience, normative and educational-methodical documentation; lesson observation); experimental (ascertaining, forming, control experiments); methods of mathematical statistics and graphical representation of results (KURMANOV, et al., 2015).

3. EXPERIMENTAL FACILITY OF THE RESEARCH

The experimental facility of the research was "Syr-Darya" university, south Kazakhstan state university named after m. Aesop. The results show that the ratio of women to men in the statistical population of the study was 55.6% and 44.4%, respectively. The mean age for men and women was 34/92 and 38/83 years. 74.4% and 25.6% of them were married and single, respectively. The field of study was 27.8%, 14.4% and 57.8% of them respectively in physical education, management and other fields of study.

-Research stages. The research of the problem was carried out in three stages: at the first stage, theoretical analysis of the existing methodological approaches was carried out in philosophical, psychological and pedagogical scientific literature, dissertation papers, and in theory and methodology of pedagogical researches; problem, object and methods of research are singled out; the plan of experimental research was drawn up; at the second stage, a

model was developed for forming the readiness of future teachers to innovative activities in a general education school; the technology of forming the readiness of future teachers to innovative activity in a general education school was developed; experimental work was carried out; the conclusions, obtained during the experimental work were analyzed, tested and clarified; at the third stage experimental work was completed, theoretical and practical conclusions were specified, the obtained results were generalized and systematized.

4. RESULTS

Modern society expects that their graduates who are able to confidently navigate the ever-changing world, competently operate on incoming information; who is communicative and ready for creative interaction. These graduates should independently recognize the problems and ways of their rational solution. New approaches to the training of a modern specialist are based on the awareness of the need for improvement of the conditions that facilitate full disclosure of personality, its self-realization and professional development. It is not enough for a modern teacher to have deep knowledge in the field of the studied disciplines and to possess a certain set of practical skills. The fulfillment of professional tasks presupposes a creative approach to the tasks, the organization of professional activity aimed at rational transformation of reality. Thus, the formation of future teacher's readiness to innovate activity in the process of vocational training is one of the topical areas of the modern educational process. The urgency of the problem is caused by the need for the future

teacher's readiness to innovative activity and insufficiently developed theoretical, content-technological and scientific-methodical aspects of training teachers for innovative activities in general education schools.

-Research objective: The object of the article is to develop a structural conceptual model of the future teacher's readiness to innovate activity in the context of systemic pragmatic approach and its testing.

-Research methods: The main method of research in this problem is modeling, which allows to consider this problem as a process of purposeful and conscious formation of the future teacher's readiness to innovative activity.

-Research results: The article presents a structural conceptual model of forming the future teacher's readiness to innovative activity, consisting of interrelated motivational, content, procedural components; the features of these components have been revealed; an algorithm for implementing this model has been developed.

-Practical relevance: the model is aimed at forming the readiness of future teacher's to innovate activity in general education schools; it is focused on the development of scientific and methodological support for this training.

4.1. Structure and concept of the model

The developed structural conceptual model of the future teacher's readiness to innovation activity was based on the analysis of the subject-teachers activity and surrounding conditions (social and professional

background). The development of the model based on the structure of innovative activity of teachers allows us to look more closely at the problem under research, and evaluate the quality of the work in various parts of the hei, and build the model as a standard, based on which the higher school can organize and plan its development (figure 1). Building the process for forming the future teacher's readiness to innovative activity, taking into account the structural conceptual model and directions of innovation activity, means to ensure the unity of the main subjects of such readiness, its goals, functions and means used to achieve optimal results, oriented to the personality of teacher-innovator. The main functions are not only educational in a broad sense, but also developing, formative, managerial. These functions also serve for creation of organizational and pedagogical conditions that ensure functioning of a structural conceptual model of forming the future teacher's readiness to innovate activity. Such readiness includes normative- legal, program-technological and methodological support of activities, pedagogical leadership and the process management as a whole. The effectiveness of the future teacher's readiness to innovative activity is determined in the unity of the following components: creative attitude to pedagogical innovation; theoretical readiness of a future teacher for the implementation of innovative activities in school (knowledge of pedagogical innovation methodology, the essence of innovation processes, features of innovation systems, etc.); practical readiness of the future teacher to innovative activities (the availability of pedagogical skills). It is necessary to develop the structure and content of the future teacher's readiness to innovative activity as a complex psychological and pedagogical system characterized by the unity of psychological, pedagogical and content components (figure 2). Readiness of a future teacher to innovative activity (like any other readiness) includes

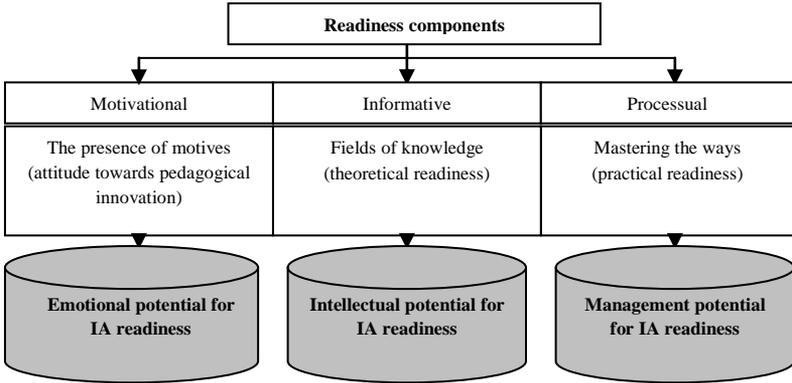
motivational, informative and processual components. In this connection, we understand the readiness of future teachers to innovate activity as mastering all components of this activity, and we consider readiness as an integrative quality of the future teacher's personality.

4.2. Stages of model implementation

The introduction of this model has the following stages of experimental work:

- Determination of the readiness initial level, using testing methods, and questioning, pedagogical observation, statistical processing of the research results;
- Development and implementation of scientific and methodological support, which contributes to the successful functioning of the structural conceptual model for preparing future teachers to innovative activities;
- Determination of the readiness level and identification of the dynamics for future teachers to innovative activity in a general education school.

Fig. 2. Structure and content of the future teacher's readiness to innovative activity in regular school



4.3. Ascertaining stage

To establish the effectiveness of experimental work with future teachers, we used pedagogical assessment method, which made it possible to reveal the formation dynamics of the readiness aspect. At the first stage, the initial state of this readiness for 1-4 courses was revealed.

Table 1: The state of readiness of future teachers for innovative activity in regular school (in %)

№	Studied courses	Levels of readiness formation (in %)		
		High	Average	Low
1	I	28	47	25
2	Ii	30	46	24
3	Iii	33	44	23
4	Iv-control	36	43	21
4	Iv-experimental	38	42	20

The table shows that the level of readiness of future teachers to innovative activity in general education school at all courses is low.

4.4. Forming stage

We have conducted a purposeful work using our methodology.

We guided the future teachers through the main stage, which is teaching elective courses such as "pedagogical innovation" and "innovative pedagogical technologies" to bring them to the practical implementation of the main didactic purpose of the teacher - the formation of students' ability to learn. "Pedagogical foundations of innovative activity of the teacher" course developed by us, served as a tool for improving the qualifications of the future teachers in the field of innovative activity. The next elective course "pedagogical innovation" was delivered by the author for several years (2015-2017) for future teachers of different pedagogical specialties. The course consisted of lectures and practical exercises in the amount of 45 hours and was included in "elective courses" block. The goal of the course was to familiarize future teachers with the subject, tasks, methodology of pedagogical innovation, its composition, structure and functions, as well as innovative educational processes taking place in Kazakhstan and abroad. We also organized and conducted "innovative pedagogical technologies" elective course for graduate students. The goal of this course was to familiarize future teachers with the essence of pedagogical technology, history of its development, the classification of pedagogical technologies, and also teach future teachers to design and implement innovations in the educational process of regular

school. In the process of conducting the formative experiment, we developed innovative exercises on the example of "pedagogy" course, which contribute to the formation of professional knowledge, skills and qualities in future teachers. The effectiveness of these classes has been tested using standard and experimental criteria. The activity of the center for innovative education "future school" created by us was aimed at creating conditions that ensure each future teacher the opportunity to disclose individual abilities, develop research skills, determine the criteria for an innovative school, study the innovative experience of regular schools with a view to generalizing and distribution them in practice, the development and implementation of pedagogical innovations, the organization of an advanced training course for hei professors and schoolteachers on teaching topical issues of pedagogical innovation. Practice has proved the effectiveness of this center.

4.5. Control stage

The subsequent "assessments" were taken after a purposeful work using our methodology. The second "assessment" was conducted with the students of 2 - 3 year, after studying the basic courses of psychological and pedagogical disciplines, private techniques. The third "assessment" was conducted after the end of the pedagogical practice of the graduate students, i.e. the effectiveness of experimental work can be traced in independent practical activity. The readiness level of students to innovation in regular school was checked by taking into account the previously described criteria and indicators and the use of methods and new research technologies. The analysis of diagnostic characteristics of the readiness of future teachers to innovative activity in regular school at

the end of the experiment indicates that significant changes have taken place at all levels. The dynamics of the readiness can be traced in table 2.

Table 2: Changes in the levels of readiness of future teachers to innovative activity in regular school (in %)

№	Studied courses	Levels of readiness formation (in %)		
		High	Average	Low
1	I	28	47	25
2	Ii	29	46	24
3	Iii	33	44	23
4	Iv.	36	43	21
4	Iv.	42	42	16

As can be seen from the presented data, high level of readiness for innovative activity was demonstrated by an average of 42% of graduate students. Representatives of a high level have mastered not only the knowledge system of the program, i.e. Theory and practice knowledge of pedagogical innovation, the methodology of developing and applying pedagogical innovations, transferring innovative experiences, but also began creatively treat the problem of introducing pedagogical innovation in general education school. Significant growth is observed in the average level of the readiness formation (42% of respondents), characterized by the mastery of innovative knowledge, availability of innovative skills, and an active positive attitude toward pedagogical innovation. A low level is observed in 16% of future teachers, who demonstrated: mastering of certain innovative skills, positive-passive superficial attitude to the implementation of innovative activities, fragmentary interests, lack of

examples of involving their colleagues in the development and application of innovations.

Proceeding from the profессиogram of a general education school teacher, we believe that low (16%) and average (42%) levels of future teachers readiness to innovative activity can be attributed to sufficient, then together they make up 58% of the surveyed graduates. High level (42%) of readiness is considered ideal; we should focus on this ideal during organization of teaching and educational work in hei. This table shows that it is necessary to conduct a purposeful, systematic work on the formation of future teachers' readiness to innovative activity from the first year; the interrelated work of pedagogy and psychology departments, private methods, special disciplines is necessary; special courses give an increase in the dynamics of the studied readiness. Analysis of the table shows that in the process of experimental work, there is an increase in the high level of future teacher's readiness to innovative activity (from 28% to 42%). It can be seen from the table that the low level of future teacher's readiness to innovative activity is significantly reduced: 1 and 2 year - 25% to 16% for the final-year students. If at the beginning of the experiment the future teachers had weak innovative knowledge, skills, motives, then in the end we see a significant growth. The students of the experimental group statistically exceed the students of the control group in terms of the readiness to innovation activity.

As a result, it can be stated that the results obtained are reliable and statistically significant. Therefore, with a probability of 99%, it can be said that the number of future teachers with a high level of readiness to innovative activity in the experimental group is significantly larger than in the control group. Experimental work on formation of future teacher's

readiness to innovative activity has allowed us to establish the dynamics in all structural components of the model. Analysis of the experimental work results shows the effectiveness of the developed technology on the formation of the future teacher's readiness to innovative activity in general education school. During the experimental work on the technology developed by us, we have eliminated the gaps in the formation of future teacher's readiness to innovate activity, which has been reflected in their knowledge, skills and motivations.

5. DISCUSSION

The study of psychological and pedagogical literature allows us to state the absence of special studies devoted to the problem of forming future teachers' readiness to innovative activity. The problem of innovation was relevant throughout the history of the development of pedagogical science and the school.

Problems of innovation in education received coverage in the works of (HIEBERT, et al., 1996, BROWN, et al., 1999, BLÖMEKE, et al., 2014) see innovations from the methodological standpoint. The use of innovative methods and forms of education was reflected in the works of (BEKISHEV, 2013, YAKAVETS, 2014, KERIMBAYEV, et al., 2016) and others. At the same time, the complexity and versatility of the innovation theory etiology leads to introduction of many scientific approaches to its study in different fields of knowledge. The theory and practice condition of higher education shows that, despite the ongoing reforms in the system of higher education and intensification of the

research on various aspects of pedagogical innovations, the problem of organizing a purposeful process as one system for forming future teachers' readiness to innovation activity is still present. Innovative activity in general education school is considered by us as one of the work aspects of an educational institution in development dynamic, which is understood as the sequence of certain stages characterized by positive qualitative changes. This activity provides a kind of deviation from the norm, representing a standard recognized in specific socio-economic conditions; introduction of alternative norms, their borrowing from other spheres. It provides a combination of means for development, presupposes a conscious transformation of pedagogical reality. The innovative activity of the school, in our opinion, is the activity of school, in which the idea turns into an innovation, and a system for managing this process is formed. Formation of the future teacher's readiness to innovative activities in regular school is based on a profound analysis of the content and nature of the teacher's work. In order to obtain a complete and objective idea of the innovative activity in this category, it is necessary to build an appropriate structure. When developing the structure of the teacher innovative activity, two interrelated and interdependent objects were taken into account: the personality of the teacher and his/her innovative activities. We consider such activity on the one hand as a generalized and largely unified phenomenon, and on the other hand as a system typical for a certain range of subjects (officials) fulfilling common goals of school education such as preparing students for independent living and work in accordance with the requirements of social procurement. This activity consists in a series of separate actions (ways to achieve a common goal) and interrelated components, each of which corresponds to a certain professional function of this subject teacher. Forming the structure of

innovative activity, we have chosen from all the qualities and properties only the most professionally significant, generalized for the specialty of the teacher.

The readiness of future teachers for innovative activities in a general education school is formed in the course of university vocational training. The future teachers readiness to innovative activity in general education school is defined by us as an integral personal education, which includes the development, search, mastering and use of pedagogical innovations, manifestation of the corresponding management qualities in order to reveal the degree of their novelty. The development of this model based on the structure of innovative activity of a teacher allows us to look more closely at the problem under study, to evaluate the quality of the work of various parts of the university, and to build the model as a standard, based on which the higher school can organize and plan its development. System and structural analysis and study of the teacher's professional-qualification characteristics have created the necessary prerequisites for building a model for the formation of the future teachers' readiness to innovative activity in general education school. The tasks of our research are closely related to the structural conceptual model, which allows us, by establishing the structural similarity of the model and the original, based on content model information, to obtain information about the original content. The search for the constituents of a structural-content model for the formation of future teachers' readiness for innovation showed the following components: goal, objectives, theoretical and methodological basis, content, principles, monitoring, and result. The structure and content of the future teachers' readiness for innovative activities as a complex psychological and pedagogical system is

characterized by the following content components: motivational, content and procession. The structure and content of the future teacher's readiness to innovative activity include the following:

- Emotional potential of the future teacher's readiness to innovative activities, including psychological aspects;
- Intellectual potential of the future teacher's readiness to innovative activity, based on the necessary knowledge;
- Managerial potential of the future teacher's readiness to innovative activity, containing motivational, role, guiding components. In pedagogical science and in practice, the desire to comprehend the whole pedagogical process from the position of management science, to give it a scientifically grounded nature, is increasingly intensified. Management in relation to the learning process is a focused, systematic impact of the teacher on future teachers and an individual student to achieve the desired learning outcomes. The main task of managing the process of innovative future teacher's readiness is to strengthen the dynamism and stability of educational and innovative activities, to guarantee higher results of this training by regulating the efforts of the teaching staff in achieving the goal. In the developed program of the continuous managerial process for forming the readiness of future teachers to innovative activity, we distinguish three main management cycles:
 - objective, focused on determining the real state of the problem at all implementation levels, developing a technology for readiness of

future teachers to innovative activity, training faculty for the introduction of technology for future teachers readiness to innovative activity;

- effective and practical, endorse the meaningful lines of forming the readiness of future teachers for innovative activities, i.e. The potential of state compulsory educational standard, the technology for forming the readiness of future teachers for innovative activities, the system of elective courses ("pedagogical foundations for the innovative activity of teacher" for university teachers, "pedagogical innovation" and "innovative pedagogical technologies" for future teachers). Decision-making on the functioning of the innovation center "future school", on managing the process of preparing future teachers' readiness for innovation based on the results of monitoring the formation of their innovative readiness.

6. CONCLUSION

The purpose of this study was to determine the relationship between organizational culture and organizational entrepreneurship in Kazakhstan General Education Department. The results of the research showed that there is a positive and significant relationship between organizational culture and organizational entrepreneurship. It was found that the readiness of future teachers for innovative activities in general education schools, as an integral personal education, can be effectively formed **provided that** scientifically substantiated methodological,

methodological and technological fundamentals for the solution of basic psychological and pedagogical tasks (readiness model, program of continuous managerial process, monitoring system and implementing technology) as a single pedagogical system. **The above mentioned** will ensure the study, mastering and use of pedagogical innovations by future teachers, manifestation of their respective managerial qualities, **since** this corresponds to new achievements and prospects for the development of an innovative education system.

Thus, the research key tasks were solved, theoretical and experimental data that confirm the originally proposed hypothesis were obtained; that allows us to draw **general conclusions**:

- Personal, activity, reflexive, synergetic and systemic approaches chosen as methodological guidelines set qualitatively new parameters in the study of preparing teachers for innovation;
- Innovative activity of a teacher in a comprehensive school is an essential characteristic of an integral pedagogical process and is an object of professional training for a teacher;
- the readiness of future teachers for innovative activities is an integral personal education that combines motivational, content, procedural components that include emotional, intellectual, managerial potential of readiness for innovation;
- technological model of forming the readiness of future teachers for innovative activities in a general education school includes monitoring of its formation, business games, trainings,

development of future specialists in innovative activities;

- the main trends in the process of forming the readiness of future teachers for innovative activity in general education school make up its dependence on theoretical and technological components of professional and pedagogical education and competence of the faculty staff.

The findings do not pretend to be an exhaustive solution to this problem. For further improvement of the innovative readiness of future teachers, in our opinion, it is necessary:

- To improve the existing standards (curricula and programs), taking into account modern reforms in education, culture and economy;

- To broaden the curricula, research task programs;

- To strengthen the interrelationship of pedagogical specialties of higher education institutions and general education schools with the aiming at constant improvement of innovation system of the latter.

In general, it can be concluded that the organizations in which the culture of supporting innovative ideas and ideas provides an area for promoting enterprise entrepreneurship. Country sports managers should consider improving cultural indicators resulting from organizational entrepreneurship. It is recommended that managers of sport organizations create a supportive organizational culture in which staff members express their thoughts freely. In such a situation, with engagement of employees,

people are empowered and able to make more creative work. By creating a good fit, employees will meet new needs and environmental and customer changes with entrepreneurship rather than traditional ones. By relying on transparent missions and employing entrepreneurial strategies, employees can realize the goals of the organization. The sports managers of the country should rely on these findings to create a suitable cultural environment in line with creativity, innovation and entrepreneurship in order to solve problems.

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