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Creative and research competence as a factor of professional training of future teachers: Perspective of learning technology

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Abstract: One of the main current objectives of countries is to achieve a high level of quality in higher education that meets the needs of the labor market problems of industrial-innovative development of the country, the identity and relevant international best practices in the field of education. This study aims to provide a comprehensive review on creative and research competence as a factor of professional training of future teachers according to perspective of learning technology. Document analysis as a qualitative research method was used in the study. It should be noted that in the framework of the Bologna process and the integration of Kazakhstan universities into the European higher education area in recent years, increasing attention is paid to the competence approach which refers to development of key competencies of teacher candidates in the training of future profession. For future teachers, it is necessary to be able to be creative in solving a variety of pedagogical technological problems in addition to mastering the specialized knowledge. Creative competencies of the

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future teachers play a crucial role in their future professional life. Results are discussed with relevant literature and implications for future research and practices are presented.

Keywords: Learning technology**,** creative competence, research competence, future teachers.

Introduction

A quality and effective education ensures that society is a leader in every field. The fact that the teachers who will provide education are well trained is a factor that changes the fate of the countries. When teachers cannot offer quality education to their students, it can be said that society loses in every sense. It is a known fact that the development levels of countries are mostly related to education. It is possible to see that the countries ranked in the first place in the international measurement and evaluation systems are developed countries. For this reason, states need to have a good education system in order to survive strongly (Ryndak & Saldaeva, 2019).

The main purpose of the organization and maintenance of a comprehensive system of creative and research competencies of students at universities is the development of methods, techniques and skills, execution of scientific, research, design work, development of their creative abilities, independence and initiative in their studies and in their future professional lives. Studying with methodologically targeted systematic participation in creative and research work is a way of formation and development of students' creativity, responsibility and research skills (Cakmak & Nural, 2019; Joudi, 2019; Damy & Plascencia, 2020).

Scientific creativity in the modernization of education becomes mandatory as a means of self-development of future teachers. Scientific work of future teachers plays an important part of an integrated system of training of specialists with higher education. The success of the university's creative and research work depends on collaboration, co-creation of teachers and students. Today, there is a need for improvement in the theoretical understanding and practical action in the methodological preparation of teachers (Akmese & Kayhan, 2016; Esteves, 2017). The content of this training consists of highly professional and flexible thinking, methodological reflection, ability of scientific rationale, critical thinking and creative application of certain concepts, forms, methods, knowledge, management, construction, ownership of knowledge, which provide orientation to the changing conditions of professional activity (Rodriguez-Arteche & Martinez-Aznar, 2016; Silva & Alves, 2019).

The composition of the professional competence of the researchers includes the mobility of knowledge, flexibility of the method; critical thinking, systematic and interdisciplinary way of thinking and information literacy. Therefore, analysis of these mentioned concepts can provide both the ability and competence to effectively perform a certain kind of action. There are so many competencies as productive kinds of actions performed by a person in a professional and everyday life (Oksuz & Ozturk, 2016).

In this regard, competence approach in the higher education system makes it possible to carry out the interrelation of design of the educational and administrative processes; instrumentally link such components of methodical system of professional education as the goal, content, process; allows to dynamically respond to the current requirement for teacher training in the transition to a 12 year education, to determine the overall objective of professional education through the collection of

private competence; to strengthen the professional direction of future specialists teaching methods; to radically change the educational process and make it more productive and creative and to create a high motivational factor for a professional restoration (Afshar & Terwiel, 2019).

It can be said that a good education has brought the countries to a leading position in the world and that it needs to be under control to continue this situation. When education is considered as a whole, it can be stated that in order to increase success, it is necessary to improve physical conditions, use technology in education, improve teacher training and employment, develop curriculum, determine the goals of education, provide equal opportunities in education, assign managers according to merit and provide supervision in education (Aytaç, Demirbas-Celik & Kiracioglu, 2019; Yakubu et al., 2019; Stosic, Dermendzhieva & Tomczyk, 2020). Therefore, this study aims to provide a comprehensive review on creative and research competence as a factor of professional training of future teachers.

Research model

Document analysis as a qualitative research method was used in this research. Document analysis method covers the analysis of written and verbal materials containing information about subjects planned to be researched (Yildirim & Simsek, 2006). For this, firstly, literature review related to the subject was made, important points on teacher training, education and supervision systems and creative and research competencies of future teachers were explained and compared.

Data collection

In the study, sources such as books and articles published in scientific journals were examined in the literature review. In addition, the web pages of the education ministries of the countries such as Kazakhstan have been surveyed and current data sources on internationally recognized educational sites have been used.

Data analysis

While collecting data; the stages of accessing documents, checking the authenticity of documents, understanding and interpreting documents and using data were followed; data were examined accordingly, tabulated, interpreted and presented in the study.

Results and discussion

In connection with the material given above, it is possible to identify a number of approaches that encourage the formation of creative and research competence of future teachers (Figure 1). The first approach is to create a good psychological environment in student groups. Signs describing the enabling environment are followings: a friendly atmosphere in the group, understanding each other, recognizing the existence of different perspectives and priorities of social values, the desire of each to independence, promotion of educational achievements, initiative, creativity, the existence of communities of interest, hobbies. The main source of creative and research competence-training classes are on the subject of "Modern problems of science and elementary education", aimed at

forming interpersonal relationships, self-discovery and self-realization, the development of communication skills, ability to formulate goal-setting, as well as personal growth trainings. On training students acquire the skills of self-expression, in accordance with their individual creativity (Demirok, Baglama & Besgul, 2015; Pascu, Simo, & Vernica, 2019).

The organization of purposeful work on the formation of creative and research competence in the classroom of scientific research is the second approach. The acceptable basic course for this may be a discipline "Modern Problems of Science and Elementary Education", in the framework of which a pedagogical activity and its subject, teaching collaboration and communication, as well as patterns of learning, development f creativity, etc. are considered. At the same time a joint construction of a model of creative and research competence of the teacher, the development of self-motivation as an expert in the process of life are embodied (Abdi & Sharyati, 2019).

The third approach - providing opportunities of self-fulfillment through pedagogical activity during the passage of teaching practice. Self-control and self-analysis provide the assessment and analysis of the quality of the educational activities of students, its positive and negative aspects, development of professional personality traits, the degree of realization of the goals and objectives of its activities, the implementation of the plan for the work (which is usually included theoretical, practical experiment, various teaching and research assignments), the adjustment of their studies in order to improve it (Onder & Karatas, 2016; Winch, 2020).

The fourth approach - application on lectures and seminars the technologies of problem-based learning, projects, the implementation of interactive forms of learning, based on dialogues, the use of interactive methods of creative problem solving, student participation in simulation-modeling games. Feature of the simulation games in the classroom "Modern problems of science and elementary education" is the availability of a variety of roles in it of the future teacher, which means that game will have a role character. The main condition for the simulation and modeling games in the classroom is a model of professional orientation. In practice, there are different types of simulation and modeling game: dramatization, dramatization of the situation of social communication and situational role-playing game, outplaying of professionally-designed situations and role play (Bicen & Uzunboylu, 2013; Byker, Putman, Handler & Polly, 2017; Dishkova & Papancheva, 2019).

The fifth approach, in our opinion is based on the joint work of the teacher and students in individual counselling which is one of the important role of schools (Uzunboylu, Baglama, Ozer, Kucuktamer & Kuimova, 2017) writing term papers and final qualifying works, as well as the organization of independent scientific work of students under the direction and participation in innovative forms of work of the department and the faculty (Vidnere, Celma-Zida & Lusena – Ezera, 2017; Tenbele, 2019). A special role is played here by the teacher himself, his personal position, personal research potential and the ability to build a joint venture, partnership in implementing the pedagogical process. The teacher should observe a democratic style of work, a high level of empathy, reflection, tolerance to the personal qualities of students and their outlook, promote partnerships in the educational environment. One of such projects is a project by drafting the future primary school teacher. The purpose of the project was to construct a model of the graduate faculty on the basis of theoretical research and experimental verification of the diagnostic system of the future expert.

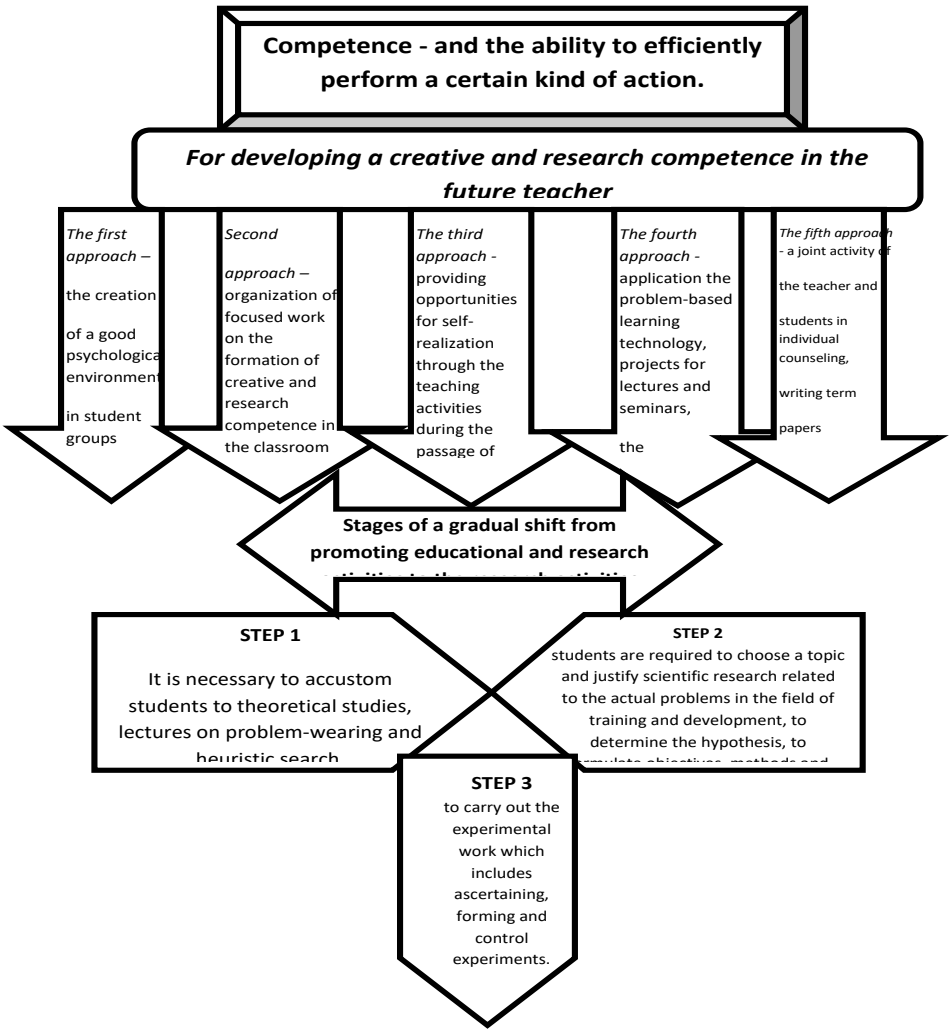

Figure 1. Competence – and the ability to efficiently perform a certain kind of action

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Conclusion and Recommendations

The basic principles of the organization of creative and research work is to ensure its comprehensiveness, which involves a sequence of fulfillment of the scientific research, implementation of the results, succession of creative and research work on the training course the logic complexity of methods, types and forms of scientific work, in which students are involved. The main requirement of the principle of an integrated approach is the unity of the educational, scientific and educational work, as well as the interaction of all the forms and methods of forming a creative personality, realized through the educational process and outside the classroom. In its turn, the research principle is aimed at organizing such activities of students, which helps to develop the students' ability to think creatively. Each lesson aims to teach to think, to handle information, to search for and apply new knowledge. The principle of humanization of education involves not only a creative approach to teaching both basic and profiling cycle, but the logic of the development of the students for the world of pedagogy and contemporary issues in science, etc. All these principles are aimed at achieving high and lasting results in the training of students and graduate students, in particular, on the development of their creative abilities.

Scientific and creative work of students - this is the original independent, performed research work, containing formulation, development, solution of a scientific problem in the field of pedagogy. It should be closely related in content to the specific future profession. Synthesis of informational, communicational, search, diagnostic, designing, modeling knowledge and skills which allows students to implement research activities is creative and research competence. Creative and research activities of bachelors and masters should include a number of interrelated steps that contribute to a gradual shift from teaching and research to the scientific research activities, from the primary scientific work (essays, reports, presentations) to participation in the scientific research work of students (SRWS) and implementation of theses and dissertations.

In forming experiment the programs to study the problem and the range of tools, technologies, methods and forms to improve the organization of the educational process, the development of summaries of lessons, scenarios of educational affairs and cultural events, plans, interest groups, the development of educational-cognitive and creative tasks, teaching situation, forms of work with parents, projects on subjects, portfolio of undergraduate and graduate students, intensive and interactive technology research, training, business games, case studies, debates, questionnaires, discussions, training, computer presentations, etc. are developed (Prevalla, 2016; Baglama, Yikmis & Demirok, 2017; Kanbul & Uzunboylu, 2017). Here are examples of the undergraduates' tasks:

The task. Participation in the seminar (discussion of problems in training or debate)

Example 1: Interactive learning technology.

Organizing training time on "The emergence of science and the main stages of its development" includes an interactive method zinger - "Mirror". Then it shows the presentation of the material of science as the main tool for the development of society by the students. Work with the text in the content, which included abstracts related to the subject of seminars with the help of table INSERT. Then, students are given the opportunity to put the problem and justify the ways of solving it.

Example 2: Split-level education technology

Lesson on "The Dynamics of scientific knowledge: a comparative analysis of the concept of development of knowledge" after the debate it involves the development of differentiated cards in order to check the level of assimilation of the gained knowledge. The task of the students was a compilation of three-level maps, questionnaires. The result of applying such a task in practice is a visual representation of the level of development of creative and research competence of future teachers and therefore they would be able to integrate technology in education which is a core competence for teachers in this century (Uzunboylu & Tugun, 2016).

In a control experiment, a system of monitoring, evaluation tasks, questions, tests, questionnaires and other materials, the difficulty and complexity of which should correspond to the difficulty and complexity of educational and cognitive tasks, pedagogical tasks for the control and experimental groups, proposed in the previous stage of the experiment. Based on these results the final conclusions are formulated, estimated novelty of the results determined by the significance of the theory of pedagogy and the ability to use in the educational process in secondary schools.

Therefore, the results explained above can be noted that in the process of preparation of future teachers of creative and research activities is one of the most important forms of the organization of the educational process, which includes the training of students to set creative and research tasks with pre-unknown outcome; the solution of these tasks in a sequence of stages, typical for scientific research, presentation of the results of its own research activities and their implementation in practice.

Regular trainings can be planned to improve teachers and follow the innovations in the field. Efforts can be made to ensure that teachers and managers who have an important role in their development work more efficiently. An incentive system can be created for existing administrators and teachers to improve themselves in terms of creative and research competencies. Identifying and introducing successful teachers and administrators in their profession and using them in other teachers and administrators training in the system can be a solution to some problems of the education system. Similar research can be done by comparing education systems, financing, teacher training, education management and supervision systems of different countries. Education and social policies should be organized in order to promote creative and research competencies of future teachers.

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