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**FORMATION OF THE CREATIVE AND PROJECTING  
COMPETENCE OF FUTURE TEACHERS' OF NATURAL AND  
MATHEMATICAL CYCLE SUBJECTS IN THE COURSE OF  
PROFESSIONAL TRAINING**

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**Abstract.** *The article represents the results of theoretical analysis of creative and project competence as a component of the professional competence of a future teacher. The author identifies the essence and structure of the phenomenon "creative and project competence", determines the criteria and levels of this competence formation, represents the model of formation of creative and project competence of future teachers in the course of professional training in the university and the results of its implementation.*

**Keywords:** *model, project, projection, creative project activity, creative and project competence.*

*Foreword.* An objective processes and social situation in Ukraine, related to development of democratization in the state, put a complex of problems before pedagogical science. Special attention should be given to modernization of a higher pedagogical education, supporting with science-based transformations in educational strategies and structures in general, search for a new content, methods, mode of study and realization technologies of these transformations in the course of future teachers' training, enactment of professionalism in educational system. Changes in schooling demand from a teacher the skills to transform complete and integrate present material which, in its turn, impossible without a pedagogue's project competence.

Summary of publications on the subject of research. Currently, projection in pedagogics is referred as to the procedures of normative and algorithmic character as to the techniques of a teacher's creative activity. Structurally projecting component as one of the most popular components of teachers' professional proficiency is defined by N.V. Kuz'mina: "It (this component) includes actions concerning forestalling, "getting ahead"- prevision of the system of consequences solving the system of tasks during a definite time set aside for planning" [2, p. 37]. Structurally projectual skills are "a system and action sequence of a pedagogue which deals with solving pedagogical tasks with designing an object of a pupil's learning and cognitive activity subordinated to the targets of his / her upbringing" [2, p. 102].

N. Yakovlyeva defines projecting competence of a teacher as the unity of knowledge, skills and features of a person necessary for preparing and

implementation of pedagogical projects into educational process, which increase the quality of pupils' education. Herewith, the researcher underlines that projecting competence isn't a new formation which appears on its own in the process of a pedagogue's establishing, - it needs to be specially formed. Being a part of a pedagogue's professional competence, projecting competence, in N.Yakovlyeva's view, can be successfully formed in conditions of a high school educational process [5].

S.Skvortsova identifies teacher's projecting competence as an ability of a teacher to project an educational process during a studying year, to project the lessons upon various learning and teaching sets according to modern demands, capacity for modeling teacher's and pupils' activity at each stage of a lesson focusing on achievement of educational results [3].

The problem of the development of a creative personality has been studied by scientists (G. Alder, J. Gilford, V. Klymenko, E. Luzik, A. Maslow, D. Popper, A. Potebnya, V. Romenets, K. Rogers, P. Torrens, L. Shelestova). The essence of pedagogical creativity was considered by V. Andreev, F. Honobolin, V. Zagvyazinsky, V. Slastonin and others. I.E. Bryakov defines the creative competence of a teacher as an integrative multifactor quality of an individual, which is a complex dialectical relationships with professional competence, and determines the development of pupils' and students' creative abilities [1] on a professional basis. AG. Shumovska believes that the creative competence of a teacher is a "set of creative, communicative, team competency and personality traits (motivation for success, curiosity, predisposition to risk, imitativeness), which is aimed at adoption and creation of a new pedagogical product, generation of ideas, solution of pedagogical tasks, which potentially determines the formation of pupils' creative competence "[4].

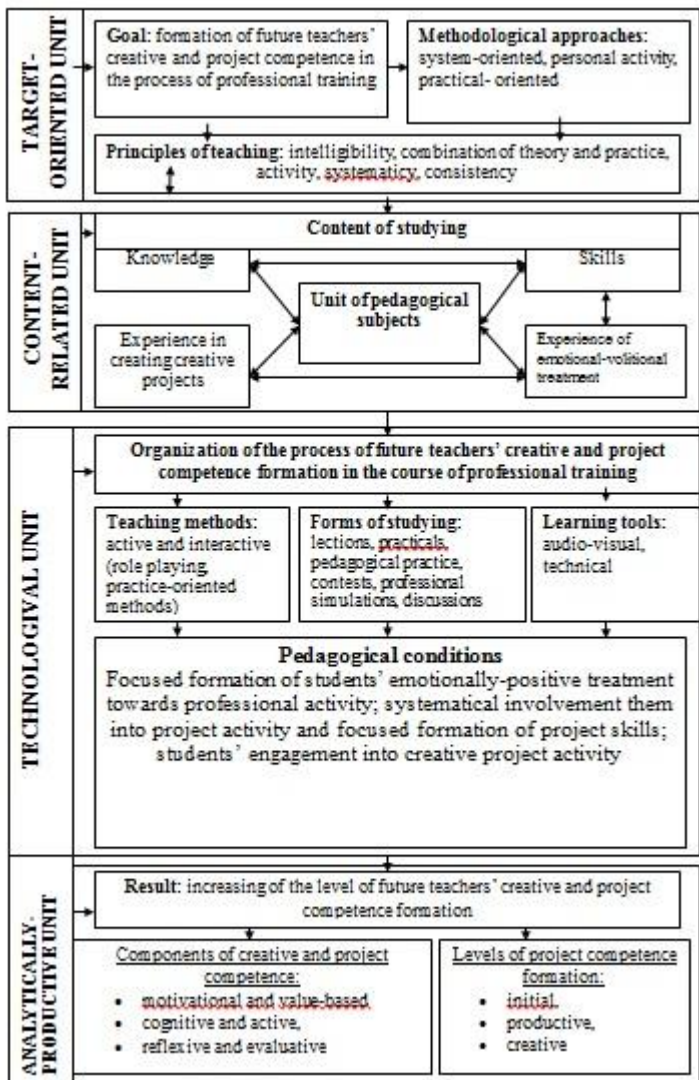
Research materials and methods. Based on analysis of professional competence, taking into account the tasks to be performed by a future teacher, on the bases of analysis the following concepts "projecting competence", "creative competence", "projection", "project activity", "creativity", "creative activity", "creative person" it was defined the concept of "projecting and creative competence" of future teachers, which has not been researched yet.

The concept of "projecting and creative competence" of a future teacher is understood as an integrative professional and personal quality based on knowledge, skills, personal experience and values of a teacher which contribute to the effective preparation and implementation of creative educational projects. We distinguish the following components in the structure of projecting and creative competence of future teachers: motivational, cognitive, operational and estimation component. Motivational component includes a positive attitude towards the creation of educational projects, the desire to solve pedagogical creative tasks and incentives for manifestations of activity and autonomy in project activities. Cognitive component includes awareness of contemporary

creative projecting technologies, the system of knowledge about the methodology of teaching disciplines on the basis of application of creative technologies, understanding the specifics of the use of ICT in the course of project and creative activity. Operational component represents experimental, organizational, designing skills which allow to project and implement creative educational technologies, realize the organization of independent creative work and project educational and creative work with the use of ICT. Estimation component is an ability to evaluate objectively the achievements regarding the use of creative technologies in their own project activity; an ability to analyze and reflect their own creative activity; capacity for self-improvement

In accordance with the definition and structure of creative and projecting competence, criteria (motivational and value-based, cognitive and active, reflexive and evaluative) and levels (initial, productive and creative) of its formation were revealed.

Taking into account the requirements of the competence approach to the educational process, a model of future teachers' creative and projecting competence formation in the process of professional training was developed.



*Pic. The model of future teachers' creative and project competence formation in the process of professional training*

The developed model is a set of components including objective, content, technological, analytical and productive blocks. Each block of the model is targeted at forming the corresponding component of projecting competence. The interrelation between them ensures the system integrity of the competence as a result of the functioning of the model in the system of future

teachers' training. Productivity of the model's functioning is ensured by observing a number of conditions: purposeful formation of students' emotionally positive attitude towards professional activity; systematic involvement into projecting activity and purposeful formation of projecting skills; inclusion the students into creative project activity.

Objective block of the model is represented by a target and tasks. The main target is formation of students' creative and projecting competence in the system of their pedagogical training. The main goal is realized through methodological approaches to the organization of the process of students' pedagogical training: system-based, personally active, practically oriented, taking into account the following learning principles: accessibility, connection of theory and practice, activity, systematicity and consistency.

Content block of future teacher's creative and projecting competence formation in the system of their pedagogical training includes knowledge, skills and abilities formed in the course of learning process, experience of designing creative projects, experience of the emotionally-volitional relationship. Moreover, the informative block assumes familiarization with the theoretical bases of the project activity and its realization in educational process; the disclosure of theoretical and practical foundations of various elements of creative and projecting competence formation.

The technological block of future teachers' creative and projecting competence formation in the process of studying pedagogical disciplines includes: forms of training organization (lectures, practical classes, work experience internship, competitions, business games, discussions); teaching methods (active and interactive (game methods, modeling of professional activity in the educational process)); means of training (audiovisual, technical). The main task of technological block is to array clearly an educational process of pedagogical training oriented to the development of creative projective activity and purposeful formation of projective skills. Abovementioned projective skills include skills to project definite educational situations and to choose their optimal decision; ability to project all components of a creative lesson beginning with the goal-setting to control and analysis; capacity for projection a system of lessons on a single topic.

The analytical and productive block assumes holding of intermediate and controlling analytical procedures and researches of the effectiveness of learning events carried out in the course of interaction of the subjects of educational process. The main task of the block is to identify the levels of future teachers' creative and projecting competence formation.

Results and its consideration. In accordance with the developed model, a pilot experiment was conducted. Appropriate experimental work was carried out during 2016-2017 studying year on the basis of the Faculty of Physics and Mathematics of the PNPU named after K. D. Ushynsky. Totally, 50 students (4

course) were involved into pedagogical experiment, they formed experimental (EG) (25 students) and control (KG) (25 students) groups.

In the course of summative stage of the experiment EG and KG were chosen and their homogeneity was checked. The data from the initial assessment showed that students of KG and EG were approximately in equivalent positions: at the initial level -48% of students of KG and 51% of students of EG; on the productive level - respectively 41% and 38%; at a high level, the number of students in the CG and EG was the same -11%.

At the formative stage of the pedagogical experiment the developed model of future teachers' creative and projecting competence formation was implemented. Determination of the level of creative and projecting competence formation (C) is carried out by the formula (1):

$$C = Cr1K1 + Cr2K2 + Cr3K3, (1)$$

where: Cr1 - number of points for assessing the motivational and value-based criterion;

Cr2 - the number of points for assessing the cognitive and active criterion;

Cr3 - the number of points for assessing the reflexive and evaluative criterion.

Weighted coefficients for criteria of creative and projecting competence: K1 = 0,2; K2 = 0.5; K3 = 0.

The results of the pedagogical experiment (represented in Table 1) showed that according to the established levels of formation of creative and projecting competence, the number of EG students who reached a high level is more than 8%, than in KG, and productive - by 5%. The number of students with an initial level of creative and projecting competence formation in EG is 13% lower than in KG.

Table 1

The levels of future teachers' creative and projecting competence formation in control and experimental groups

Groups	Levels of formation, %					
	Initial		Productive		Creative	
	Summative	Formative	Summative	Formative	Summative	Formative
KG	48	40	41	48	11	12
EG	51	27	38	53	11	20

**Conclusion.** The analysis of the research results shows positive changes in the formation of creative and projecting competence of EG students. The revealed difference allows to assert that implemented model contributed to the increase of participants' level of creative and projecting competence formation.

Thus, in the course of analysis of the results of experimental research, the effectiveness of implementation of the developed model in the process of

professional training has been proved. Attained results give grounds to assert that research objective was achieved.

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