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## MODELING OF THE FORMATION PROCESS OF METHODOLOGICAL COMPETENCE OF FUTURE TEACHERS IN THE CONDITIONS OF UNIVERSITY EDUCATION

*The article analyzes the current requirements for professional training of future teachers, emphasizes the importance of its methodological component. Based on the analysis of scientific sources, the importance is proved, the essence is substantiated and the peculiarities of application of modeling in the conditions of higher pedagogical education, which has the ability to combine the possibilities of theoretical and empirical knowledge of pedagogical reality. The intermediate status of modeling between theory and experiment in the conditions of pedagogical education is proved. The model as a result of modeling is characterized, its essence is defined, distinctive features and types of models created in pedagogical education are presented.*

*The author's understanding of the essence (abstract image of the process of formation of methodical competence of future teachers, integral operational system, which schematically and generalizedly reproduces its structure, stages, conditions, methods and mechanisms of implementation, relationships and relationships between elements) and basic functions, gnostic, reproductive, transformative, prognostic) developed conceptual model of formation of methodical competence of future teachers.*

*The principles of realization of the developed model are defined and described. The author substantiates the components of the proposed model of formation of methodological competence of future teachers. Its content is revealed through three interrelated stages. The theoretical and methodological stage involved determining the methodological principles of building the process of formation of the studied phenomenon; procedural-technological – technological support of the process of formation of methodical competence of future teachers on the basis of realization of scientifically substantiated pedagogical conditions; reflexive and effective included monitoring the formation of methodological competence of future teachers.*

**Key words:** methodical competence, future teachers, modeling, model, stages, principles, university education.

*(статтю подано мовою оригіналу)*

One of the most important tasks of independent Ukraine is its European integration, modernization, and as a result – sustainable innovation development, the driving force of which is an effective system of higher professional education. An indicator of its effectiveness is the release of competitive professionals who are ready to show their professional qualities and successfully pass an objective competitive selection. The reality of achieving this goal significantly depends on the quality of training of teachers in university education. This led to the emergence of new requirements for future teachers, according to which he must have the level of knowledge, skills and attitudes to be able to comprehend, appropriate and use innovative and traditional tools, methods, techniques, techniques and technologies of educational activities that reflect advanced world experience and achievements of modern scientific thought. In fact, we are talking about a high level of its methodological competence.

The problem of forming the teacher's personality is covered in detail in a number of studies (V. Andrushchenko, I. Bekh, V. Bondar, V. Voitko, E. Grishin, S. Goncharenko, O. Dubasenyuk, M. Yevtukh, N. Kuzmina, M. Lazarev, A. Mudryk, L. Necheporenko, N. Nychkalo, V. Oliynyk, S. Sysoeva, L. Spirin, N. Tarasevich, N. Chepeleva, T. Yatsenko, etc.). The content, features, structure, functions of pedagogical activity, factors that significantly affect its effectiveness, specifics, methods and technologies of formation of readiness for its implementation in the educational process of higher education have been studied by I. Bogdanova, F. Gonobolin, V. Zagvyazinsky, A. Kapska, N. Kichuk, Z. Kurland, A. Linenko, V. Lugov, O. Moroz, O. Pekhota, M. Skatkin, G. Shchedrovitsky and other scientists.

Despite the significant development of problems of the methodological sphere of professional and pedagogical training (O. Abdullina, K. Abramenko, A. Bogush, N. Vereshchagina, L. Nikitina, E. Pasov, L. Spirin, L. Talanova, E. Tamozhnyia, V. Shagan, etc.), including teachers of certain subjects, educators, teachers (I. Artemyev, A. Karachevtsev, E. Kovalenko, T. Kocharyan, N. Morse, Y. Podpovetna, N. Solovova, V. Sharko etc.), issues related to modeling the process of formation of methodological competence of future teachers have not yet been the subject of special research.

**The purpose of the article:** to prove the importance of modeling in pedagogical education and substantiation of the components of the model of formation of methodological competence of future teachers.

Modeling was chosen as an effective method that helps to theoretically comprehend the possibilities, direct and optimize the process of formation of methodological competence of future teachers in the conditions of university education. Usually in the philosophy of modeling is understood as the process of creating a specific object designed to study and reproduce the essential characteristics of the studied phenomenon (phenomenon, process) [7; 8].

Modeling in pedagogical research is interpreted as «a theoretical way to reflect the form of existence, structure, composition and structure of functioning or development of a pedagogical object through the disclosure of component composition and internal links that allow qualitative and quantitative analysis of dynamics of changes in the studied pedagogical phenomenon» [6, p. 96].

Summarizing the above, we note that the defining features of modeling is the presence created on the basis of theoretical and practical study of the object of a particular artificial system that objectively corresponds to the object of knowledge and can replace it in certain respects. Its research provides new information about the original object. Such an artificial system, which is the result of modeling, is a model (from the Latin *modulus* – measure, sample) as an analytical or (and) graphic description of the studied phenomenon (process). A model is «an object or system, the study of which serves as a means to obtain knowledge about another original object or prototype of the model» [3, p. 131].

It is based on a mental construction that is somewhat similar and at the same time different (simplified, generalized) from the object under study. The inevitable simplification of the object of modeling allows to perceive it in the current characteristics as a whole. The model serves as a «typified reflection of the phenomenon, the result of abstract generalization of practical experience, the correlation of theoretical ideas about the object and empirical knowledge about it» [4, p. 23].

The model simulates the object of knowledge, approximates, formalizes, retains characteristics, simplifies but does not distort it, allows to present its structure, basic properties, laws of development and interaction with the world, ways to manage it under given conditions, goals and criteria; predict direct and indirect consequences of the implementation of specified methods and forms of impact on the object; is a prototype of «the state of the modeled object, carries the structure of what is not yet in objective reality» [6, p. 37].

Analysis of scientific research [3; 4; 6, etc.], allowed in addition to the above to highlight the following features of the models:

- the model can be considered as a hypothesis about the development of a certain process (thing, phenomenon) as an object of knowledge and the possible results of this process;
- the reflective nature of the model involves, on the one hand, dependence on the activities of the subject that forms the subject of modeling by highlighting its properties, on the other – activities that affect the subject of modeling;
- the content of the model depends on the characteristics of the modeled object and the goal set by the subject of modeling;
- in the model, the sides of the object of knowledge can not be connected mechanically, there must be grounds for their comparison;
- the model projects the relationship between the present and the future, and also indicates the way to move to the future as a goal.

The widespread use of modeling in pedagogical research is due to the universality and integrative nature of this method of cognition. It combines the possibilities of theoretical and empirical knowledge of pedagogical reality, which allows to give it an intermediate status between theory and experiment. The modeling process uses and creates a variety of symbolic, abstract (as certain logical constructs) and subject (as a prototype of the state of the modeled object, reflecting the properties, structure, design strategy, results of what is yet to come) models.

Analysis of modern scientific sources allows us to identify the following main types of pedagogical models such as:

- prognostic (for optimal allocation of resources and specification of goals of pedagogical activity);
- conceptual, based on information database and action program;
- instrumental, with which you can prepare the means of implementation and teach to work with pedagogical tools;
- monitoring – to create feedback mechanisms and ways to correct possible deviations from the planned results;
- reflexive (created in order to find solutions in case of unexpected and unforeseen situations) models [4, p. 24].

In our study, a conceptual model of the formation of methodological competence of future teachers. This model is considered as an abstract (ideal) image of the formation of methodological competence of future teachers, as a holistic operationally defined system that schematically and generalizedly reproduces its structure, stages, conditions, methods and mechanisms of implementation, relationships and relationships between elements [5].

The main functions of the proposed model are:

- reproducible, as it contains the idea of methodological competence as an object of knowledge, its structure and basic properties;
- prognostic, because the model simultaneously provides a goal, takes it into account, representing the order, the sequence of projected changes, guarantees the realization of the goal under certain conditions;
- gnostic, because the model, simplifying the real process of development of methodological culture of future teachers of pedagogical disciplines, allows its step-by-step study, multiplication of knowledge about it, construction of its new properties; allows to visualize the characteristic features of this process as a certain integrity;
- transformative, because it is a prototype of the process of forming the methodological competence of future teachers, because it contains a program of optimal solutions to this problem as a certain heuristic controlled technological design;
- enriching, due to the fact that it is able to enrich new information in the process of its (model of formation of methodological competence of future teachers) theoretical and practical use [5].

When designing any model, goal setting is important. In our study, the aim is to form the methodological competence of future teachers.

As the analysis of scientific research shows, the development of a conceptual model can be carried out by selecting the leading components, modules, blocks, phases, etc. In the initiated research in the development of the conceptual model, the emphasis was placed on the selection of stages necessary to understand the peculiarities of the process of formation of methodological competence of future teachers in terms of professional training.

The developed model of formation of methodical competence of future teachers is an interconnected set of elements structured into a holistic system, which is implemented in accordance with the selected stages, revealing the logic of the process of gradually increasing the level of methodological competence (from low to sufficient).

The conceptual model of formation of methodical competence of future teachers includes theoretical and methodological (provided definition of methodological principles of construction of process of development of the investigated phenomenon), procedural and technological (provided technological maintenance of development of methodical culture of future teachers). Effective (included monitoring the development of methodological culture on the developed components and indicators using the appropriate methodology).

The methodological bases of modeling in our study were the principles: additionality, integrity, dialogicity, contextuality, subjectivity, electiveness. Principles (from the Latin principium) – is the beginning, basis, starting points, basic requirements for activities and behavior that determine their direction, reflect the course of objective laws and patterns of their implementation [1, p. 493].

Principles in education are the basis for the implementation of an educational concept, they set a certain system of requirements and rules that justify the feasibility of a pedagogical innovation and regulate its application.

The formation of methodological competence of future teachers involves the relationship and coexistence of «sustainable», new and emerging is not only an essential characteristic, but also a condition of its existence, formation and development. This corresponds to the principle of additionality as a concise interpretation of the relevant pattern. After all, to successfully solve educational problems, achieve a synergistic effect, one must not forget and oppose one method, tool, technology to another, and organically and expediently use their capabilities, organically weaving into the canvas of the educational process [2].

The application of the principle of additionality in the process of formation of methodological competence is considered as a methodological basis for the complementarity of innovative and traditional forms of organization, methods and means of professional training of future teachers.

The principle of electiveness involves giving some freedom to future teachers in choosing the goals, content, forms, methods and sources of learning, its intensity as its own pace and rhythm of progress in mastering the content of training.

The principle of dialogicity requires a combination of individual and collective work in the process of professional and pedagogical training in a higher education institution, an atmosphere of cooperation and mutual understanding.

Implementation of the principle of context involves modeling with the whole system of didactic forms, methods and technologies of subject and social content of future pedagogical activities.

The principle of integrity means achieving unity and interconnection between all components of the educational process, achieving holistic content as the unity of personal experience of cultural development, cultural reproduction and cultural creation of future teachers and methodological activities that can create a new qualitative state – the formation of his methodological competence.

The principle of subjectivity aims that the formation of the future teacher as a subject of culturally appropriate methodological and pedagogical activities occurs in the process of mastering the socio-historical forms of such activities.

Thus the organization by the person of the activity concerning such mastering assumes its mobilization, coordination with requirements of pedagogical reality, reveals a personal way of regulation of activity [5].

The basis of the procedural and technological stage are defined and justified pedagogical conditions for the formation of methodological competence of future teachers, namely:

- coverage in the content of professional training of future teachers of the essence and features of methodological activities, awareness of the importance of which will occur in the context of pedagogical activities – methods and forms of implementation – problem, dialogue, panoramic lectures, brainstorming, method of logical and semantic models (didactic multidimensional technology); mind map, etc.);
- gaining personal experience in methodological activities (methods and forms of implementation – pedagogical practice, case method, virtual methodical office, master class, pedagogical design);
- ensuring the educational autonomy of future teachers (methods and forms of implementation – the method of projects, Internet technologies (remote platform), independent work, business and role-playing games, tutoring, participatory methods).

The reflexive-effective stage of the described model provided monitoring of formation of methodical competence of future teachers according to the developed diagnostic technique. Diagnostic tools contained diagnostic methods that allowed to conduct research on each of these components of the methodological competence of future teachers (cognitive, activity-organizational, reflective-evaluation, motivational-value) and their indicators.

The result of the implementation of the described conceptual model is to increase the levels of formation of methodological competence of future teachers.

**Conclusions.** The conceptual model of formation of methodical competence of future teachers determines the substantive, organizational-pedagogical and procedurally-effective aspects of the process and is formed by the relationship of theoretical-methodological, procedural-technological and reflexive-effective stages.

We see the prospect of further research in testing the experimental methods of forming the methodological competence of future teachers.

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#### **Княжева І. А. Моделювання процесу формування методичної компетентності майбутніх педагогів в умовах університетської освіти**

У статті проаналізовано сучасні вимоги щодо професійної підготовки майбутніх педагогів, акцентовано на важливості її методичного складника. На основі аналізу наукових джерел доведено значення, обґрунтовано сутність і висвітлено особливості застосування в умовах вищої педагогічної освіти моделювання, що володіє здатністю об'єднати можливості теоретичного й емпіричного пізнання педагогічної дійсності. Доведено проміжний статус моделювання між теорією й експериментом в умовах педагогічної освіти. Схарактеризовано модель як результат моделювання, визначено її сутність, представлено відмітні особливості й види створюваних в педагогічній освіті моделей. Запропоновано авторське розуміння сутності (абстрактний образ процесу формування методичної компетентності майбутніх педагогів, цілісна операційно задана система, що схематично й узагальнено відтворює його структуру, етапи перебігу, умови, способи й механізми реалізації, взаємозв'язки і взаємовідношення між елементами) й основних функцій (збагачувальна, гностична, відтворювальна, перетворювальна, прогностична) розробленої концептуальної моделі формування методичної компетентності майбутніх педагогів.

Визначено й описано принципи реалізації розробленої моделі. Автором обґрунтовано складники пропонованої моделі формування методичної компетентності майбутніх педагогів. Її зміст розкривається через три взаємопов'язаних етапи. Теоретико-методологічний етап передбачав визначення методологічних принципів побудови процесу формування досліджуваного феномена; процесуально-технологічний – технологічне забезпечення процесу формування методичної компетентності майбутніх педагогів на основі реалізації науково обґрунтованих педагогічних умов; рефлексивно-результативний включав моніторинг сформованості методичної компетентності майбутніх педагогів.

**Keywords:** методична компетентність, майбутні педагоги, моделювання, модель, етапи, принципи, університетська освіта.