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## STRUCTURAL COMPONENTS OF THE MODEL OF PREPARATION OF A MODERN PRIMARY SCHOOL TEACHER FOR THE FORMATION OF LOGICAL SKILLS IN STUDENTS

*Changes in the content and conceptual framework of primary education cause a social need to train a new generation of teachers. Modeling process is an important method and means of scientific knowledge and improvement of the process of future teachers' professional training.*

*In pedagogical science, modeling is used to solve a number of problems, the main ones are the following: optimizing the structure of teaching material; improving the planning of the educational process; cognitive activity managing; managing the educational process; diagnostics, forecasting, and designing of training.*

*The use of the modeling method in our study is intended to define priority directions of logical skills formation in primary school pupils; to ensure the consistency and integrity of the training process to their formation at pedagogical higher education institutions; to manage the process of professional training of future primary school teachers to the formation of junior pupils logical skills.*

*In the conceptual construction of the pedagogical model, we were guided by the works of such outstanding scientists, as M. Bakhtin, V. Bespalko, V. Bibler, A. Burov, N. Kagan, N. Kyiashchenko, N. Leyzerov, E. Romanov, S. Rubinstein, B. Teplov, L. Vygotzky and others.*

*The main idea in modeling the process of readiness of future primary school teachers to form the logical skills of junior pupils is to develop a model that would improve the effectiveness of this process and bring it in line with the requirements of modern society. In our research the object of the model of future primary school teachers' professional training to the formation of primary school pupils' logical skills is the context of pedagogical activity of future primary school teachers in the process of studying psychological and pedagogical subjects, teaching methodologies, mathematics and logic, as well as practice.*

*The results of the analysis of theoretical sources on the problem of future teachers' professional training allowed to develop a structural and meaningful model of future primary school teachers' professional training to form logical skills of primary school pupils. The structural components of the model developed by us are the following: target (social order, goal, tasks); methodological (approaches, principles, subjects of interaction); content and activity (content, forms, tools, methods, technologies); evaluative and resultative (criteria, indicators, levels, result).*

*All elements of the model of future primary school teachers' training to form logical skills of primary school pupils are interconnected and mutually conditioned, which is confirmed by its integrity and consistency.*

**Key words:** *primary school pupils, primary school, teachers' training, model of professional training, structural components, formation of logical skills, logic.*

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## СТРУКТУРНІ КОМПОНЕНТИ МОДЕЛІ ПІДГОТОВКИ СУЧАСНОГО ВЧИТЕЛЯ ПОЧАТКОВОЇ ШКОЛИ ДО ФОРМУВАННЯ ЛОГІЧНИХ УМІНЬ В УЧНІВ

*Зміни у змісті та концептуальних основах початкової освіти зумовлюють соціальну потребу в підготовці нового покоління вчителів. Важливим методом та засобом наукового пізнання та удосконалення процесу професійної підготовки майбутнього вчителя, формування у нього загальних та фахових компетентностей є процес моделювання. Використання методу моделювання в нашому дослідженні покликане: визначити пріоритетні напрями формування логічних умінь учнів початкової школи; забезпечити системність і цілісність процесу підготовки до їх формування в педагогічних закладах вищої освіти; зорієнтувати процес професійної підготовки майбутніх учителів початкової школи на формування логічних умінь молодших школярів. Структурними ком-*

понентами розробленої нами моделі є: цільовий (соціальне замовлення, мета, завдання); методологічний (підходи, принципи, суб'єкти взаємодії); змістовно-діяльнісний (зміст, форми, засоби, методи, технології); оцінно-результативний (критерії, показники, рівні, результат). Використання моделі підготовки майбутніх учителів до формування логічних умінь учнів передбачає наявність конкретних результатів реалізації процесу – перехід на більш високий рівень готовності за допомогою впровадження педагогічних умов: цілеспрямованої мотивації майбутніх учителів початкової школи до оволодіння методикою формування в учнів логічних умінь; удосконалення змістового наповнення та навчально-методичного забезпечення з метою засвоєння знань з логіки студентами під час підготовки за освітньо-професійними програмами спеціальності 013 «Початкова освіта в закладах вищої освіти»; використання інтерактивних форм і методів у підготовці студентів до викладання предмета «Логіка» в початковій школі.

Усі елементи моделі підготовки майбутніх учителів початкової школи до формування логічних умінь молодших школярів взаємопов'язані і взаємозумовлені, що підтверджує її цілісність і системність.

**Ключові слова:** молодші школярі, початкова школа, підготовка вчителя, модель професійної підготовки, структурні компоненти, формування логічних умінь, логіка.

Changes in the content and conceptual framework of primary education cause a social need to train a new generation of teachers. Modeling process is an important method and means of scientific knowledge and improvement of the process of future teachers' professional training. In pedagogics, modeling is used to solve a number of problems. The main ones are the following: optimizing the structure of teaching material; improving the planning of the educational process; cognitive activity managing; managing the educational process; diagnostics, forecasting, and designing of training (Podlasyj, 1999).

The use of the modeling method in our study is intended to define priority directions of logical skills formation in primary school pupils; to ensure the consistency and integrity of the training process to their formation at pedagogical higher education institutions; to manage the process of professional training of future primary school teachers to the formation of primary school pupils logical skills. In the conceptual construction of the pedagogical model, we were guided by the works of such outstanding scientists (M. Bakhtin, V. Bespalko, V. Bibler, A. Burov, N. Kagan, N. Kyiashchenko, N. Leyzerov, E. Romanov, S. Rubinstein, B. Teplov, L. Vygotsky and others).

The main idea in modeling the process of readiness of future primary school teachers to form the logical skills of junior pupils is to develop a model that would improve the effectiveness of this process and bring it in line with the requirements of modern society. In our research the object of the model of future primary school teachers' professional training to the formation of primary school pupils' logical skills is the context of pedagogical activity of future primary school teachers in the process of studying psychological and pedagogical subjects, teaching methodologies, mathematics and logic, as well as practice.

The results of the analysis of theoretical sources on the problem of future teachers' professional training allowed to develop a structural and meaningful

model of future primary school teachers' professional training to form logical skills of primary school pupils. The structural components of the model developed by us are the following: target (social order, goal, tasks); methodological (approaches, principles, subjects of interaction); content and activity (content, forms, tools, methods, technologies); evaluative and resultative (criteria, indicators, levels, result).

The content of the target component of the model of future primary school teachers' professional training is a social order, the goals and objectives. The target component includes the characteristics of the social order of professional training for the formation of logical skills, i.e. the formation of future teachers' readiness to pedagogical activity aimed at the formation of logical skills, which are determined by the goals and objectives of this process. The social order affects the position of future primary school teachers and the determination of their personal goals in future professional activities. Logical skills and the ability to solve problems with a logical load are significant characteristics of a modern primary school teacher. The purpose of this process is to increase the level of readiness of future primary school teachers to form logical skills. Specification of the goals of the future primary school teachers' professional training process allowed defining its objectives. They are as follows: 1) the formation of positive motivation of educational activity on logical skills formation; 2) providing a pool of expertise needed to achieve quality and learning outcomes; 3) the formation of pedagogical skills to solve logical tasks and exercises aimed at their usage in future professional activity.

The next structural component of the model is the methodological component. Its content includes approaches and principles for the future primary school teachers' training to form the logical skills of primary school pupils. The design of the model, according to its purpose, was based on methodological approaches that correspond to the specifics of the problem under study. In our opinion, the mentioned methodological

approaches include system, personal and activity, cultural and competence-based approaches.

The systematic approach as the methodological basis of our research determines a detailed analysis of the process of future primary school teachers' professional training to form the logical skills of pupils in grades 1–4, including its goals, content, forms, methods, conditions and results.

A choice of personal and activity approach in our study is due to the fact that it provides for the creation of conditions for self-actualization and personal development of future primary school teachers, formation of skills to solve logical problems by students at the subject-subject relations with lecturers, combination of internal and external motives, as well as the formation of mindset on the value of logic and logical skills to the younger generation as personally important quality of modern society. This approach requires the creation of such conditions under which a person appears as a subject of knowledge, activity and communication, and this, accordingly, requires the implementation of a polysubject (dialogic) approach. It is based on the fact that the essence of a person is much richer, more diverse and more complex than his activities (Ortyns'kyj, 2009: 38).

The cultural approach is a set of theoretical and methodological provisions and organizational and pedagogical measures aimed at providing conditions for the future primary school teachers to master the content of pedagogical culture and teacher's development as its subject. The creative nature of culture offers all the components of communication activity, namely modeling of personality characteristics and consequences of communication (Chaplak, 2011). We could state, that the future primary school teachers must improve their professional culture in a systematic purposeful work on themselves, in the development and improvement of the moral qualities of their own personality.

The competence-based approach shifts the emphasis from the process of accumulating standard-defined knowledge, skills and abilities to the formation and development of pupils' and students' ability to act and creatively apply the acquired knowledge and experience in various situations. According to the competence-based approach, the purpose of organizing the educational process of higher education is to create conditions for students to form an experience of independent and creative solutions to cognitive, communicative, organizational and other problems that make the content of education (Pochujeva). We believe that the introduction of a competence-based approach to the future primary school teachers' training to form

logical skills of primary school pupils will update the content of the future teacher's professional training, introduce effective forms and methods of training, as well as, ensure that future teachers are ready to form logical skills of primary school pupils as a component of their overall professional competence.

When creating the model, we assumed that the process of professional training of future primary school teachers for the formation of logical skills of pupils should be specially organized, targeted and managed. It should be also based on the following teaching principles developed in modern didactics: scientific, systematic, consistency, accessibility, connection with life and practice.

We understand training principles as a certain system of initial didactic requirements, attitudes to the learning process, the implementation of which ensures the effectiveness of practical activities (Lozova, 2006: 103). The scientific principle determines both the content and form of the educational process. This principle requires serious consideration, since, on the one hand, the child is not able to comprehend the "scientific nature of the subject", and on the other, the simplification and distortion of facts in order to bring them closer to the level of the child leads to the profanation of science. The implementation of this principle involves the study of a system of important scientific provisions and the use of teaching methods close to those applied by a particular science. It requires disclosure of cause-and-effect relationships of phenomena, processes, events; insight into the essence of phenomena and events; demonstration of the power of achievements of human knowledge and science and familiarization with the methods of science, and knowledge; disclosure of the history of science development, the struggle of trends; orientation to interdisciplinary scientific relations (Ficula, 2009: 124). In our opinion, this principle is leading in the implementation of the tasks of future primary school teachers' professional training to form logical skills, because it is based on the connection of science and technology with educational subjects in speciality.

The systematic principle and principle of consistency are linked to the scientific nature of knowledge. Their consistency determines the integrity of ideas, worldviews and even the harmony of success. These principles require the fundamentals where the consistency of presentation and the relationships between subjects should be taken into account while assimilation of knowledge. The system of knowledge on the organization and conducting of classes in mathematics have a logical direction. It is taught to students in the sequence. It is determined by

the internal logic of the educational material and the cognitive capabilities of pupils. The learning process should not only ensure the assimilation of knowledge, but also form the ability to use it for further self-education and self-improvement in the field of primary education, highlighting common concepts and using intersubject connections. For example, you should not study logic separately from mathematics, or methodology separately from pedagogy. Therefore, this principle reflects the logic of constructing and sequencing in the formation of systematic professional knowledge about the methodology of teaching concepts about logic, corresponding logical skills and abilities in a certain order and system.

The principle of accessibility regulates the interaction of teachers and pupils at every stage of the learning process, from setting goals to evaluating its results. The essence of accessibility is that students must perceive and understand the explanatory material. To organize training in an accessible way means to reach the highest limit of students' capabilities in order to constantly improve their opportunities. This line should not be crossed, because a lot of the content of the training will not be clear. The implementation of this principle involves taking into account the level of development of an individual, age-related characteristics of students, and compliance with the following rules: from simple to complex, from known to unknown, from near to far.

The principle of connection with life and practice is based on objective connections between theory and practice. Theoretical knowledge is the basis of modern productive work, which concretizes them, and contributes to a solid and conscious assimilation. The implementation of this principle is ensured by the use of acquired knowledge in professional activities, disclosure of the practical significance of knowledge, and direct participation in public life (Ficula, 2009).

The principle of practical communication in terms of higher education determines the content, tasks, forms and methods of implementing the knowledge of future primary school teachers in practical educational and cognitive activities. It also contributes to the development of cognitive independence and creative activity of the individual.

Therefore, all these principles reflect the features of constructing the educational process of future primary school teachers' training to form the logical skills of primary school pupils. For effective implementation of this process, it is necessary to apply all the mentioned principles.

The next component of the methodological block of the model of future primary school teachers' professional training for the formation of primary

school pupils' logical skills are the subjects of interaction. The subject of activity in this system is a teacher (lecturer), and the object is a student who takes the position of an active participant in the educational process.

The model of future primary school teachers' professional training for the formation of logical skills also includes a content and activity block represented by pedagogical conditions, content, forms, means, methods and technologies of interaction in the system of training a specialist.

The low level of awareness of future primary school teachers with the concepts of logic and the inability to solve logical problems and apply logical skills in practice led to identification and justification of the pedagogical conditions for future primary school teachers' professional training to form logical skills of younger pupils. They are the following:

- purposeful motivation of future primary school teachers to master the methodology of forming pupils' logical skills;
- improvement of content and methodological support of the process of training students in the specialty "Primary Education" in the context of the formation of logical skills of pupils;
- use of active and interactive forms and methods in theoretical, practical and methodological training of students to form logical skills of primary school pupils.

The content component is provided by the educational content of professional training necessary to prepare the future primary school teacher for professional activity in accordance with specific educational tasks. The content of professional training includes general educational and core academic subjects, on-the-job training and special seminars that have a direct impact on the professional training of future primary school teachers to form the logical skills of junior pupils.

The model was tested in the framework of general educational subjects ("Pedagogy" and "Psychology"), and core subjects of the mathematical direction ("Mathematics" and "Methodology of Teaching "Mathematics" as an educational branch"). In addition, on-the-job training in our study was considered as an important means of professional training of future primary school teachers to form logical skills of primary school pupils, and as a link that connects the learning process and independent work of future primary school teachers. Moreover, we have developed and introduced into the educational process a special course "Theory and Methodology of Teaching Logic in Primary School", which takes into account the variation of theoretical, methodological and practical components of the study of logic.



The leading organizational forms of training in the process of future primary school teachers' professional training are theoretical, practical and methodological. The following theoretical forms of future primary school teachers' training for the formation of logical skills of pupils are highlighted: lectures, study tours, conferences, consultations; practical forms: laboratory, practical classes and workshops, individual work and on-the-job training. Tests, exams, course papers and final qualifying works were introduced to check the level of knowledge and skills. Independent and individual work of students in solving problems with logic allows to develop students' independence, contributing to the better assimilation of educational material, and accelerate the formation of logical skills. These forms are interrelated, complement each other and represent a single process of developing thinking and forming logical skills.

System of organizational and methodical forms of practical classes conducting in higher educational institutions, taking into account individual abilities and needs of students can be represented by classes, grounded on the tasks on logic, the classes with the use of intellectual games, crossword, puzzles etc.. An important form of professional training of students is their work on individual tasks, participation in conferences and professional activities during various types of on-the-job training.

Along with the forms, content and activity block includes learning tools, which are a set of material objects and objects of spiritual competence, intended for the organization and implementation of the pedagogical process and performing various functions (Lodatko, 2010). In the study, we consider verbal learning tools (language, textbooks, manuals), visual learning tools (diagrams, tables, symbols) and technical visual and audio-visual tools. The most effective learning tools in the research process were the following: textbooks, methodological and visual manuals, ICT tools, and Internet resources.

Talking about the justification of teaching methods, we need to start with the choice of educational technologies. The fundamental technologies aimed at forming logical skills of future primary school teachers in the course of professional training should form motivational, cognitive and operational components; technologies that will facilitate the transition from a reproductive method of learning to a creative and practice-oriented one; technologies for introducing the latest teaching methods into the practical training process. Among these technologies, we distinguish the following: project technology; problem-based learning technology, information

technology, "Portfolio" technology, contextual and event-based learning. To achieve educational goals in each case, the lecturer uses various methods and methodological techniques of cooperation between the lecturer and the student.

Based on the analysis of the issue of future primary school teachers' professional training to form logical skills of primary school pupils, it was found that the training should be advanced in view of the development of the educational situation in the country, in particular the introduction of a New Ukrainian school. It should also provide the use of modern methods of educational interaction aimed at forming the readiness of all subjects of training for future professional and educational activities in modern conditions. After studying the achievements of foreign and domestic methodology of organizing the educational process in higher education institutions and generalizing our own pedagogical experience, we have chosen methods of future primary school teachers' professional training to form the logical skills of primary school pupils.

It is known that in the process of learning, the method acts as a system of sequential interrelated actions of the lecturer and students, ensuring the assimilation of the content of education. In our study, we used traditional, active and interactive methods of teaching.

In addition to the above-mentioned blocks of our structural and content model of future primary school teachers' professional training, the evaluation and resultative and conditional components are highlighted.

The evaluation and resultative block of structurally-substantial model of future primary school teachers' professional training to the formation of logical skills involves the obtaining of specific results of the process implementation, such as transition to a higher level of readiness of future teachers to the formation of logical skills of primary school pupils. The evaluation and resultative component of the model includes criteria, indicators and levels of readiness of future primary school teachers to form logical skills of primary school pupils. We distinguish the following four levels of readiness for the formation of logical skills of primary school pupils: low, medium, sufficient and high. Each of these levels interacts with the previous and subsequent levels. The conditional component of the model of future primary school teachers' professional training to form logical skills of primary school pupils contains of the above mentioned pedagogical conditions.

Consequently, all elements of the model of future primary school teachers' training to form logical

skills of primary school pupils are interconnected and mutually conditioned, which is confirmed by its integrity and consistency.

Further research is seen in testing the pedagogical conditions of the process of future teachers' training to form logical skills of younger pupils.

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