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IMPROVEMENT OF TEACHING MATHEMATICS IN SCHOOLS AND UNIVERSITIES ON THE BASIS OF SYSTEMATIZATION

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Abstract
The article discusses the importance of organic communication and systematization of knowledge in the educational process. The principle of integration is directly related to systematization of knowledge. Systematization aims to establish a set of associations that ensure the integrity of the pedagogical process, to establish clear connections between knowledge, skills and abilities, and coherence reveals the nature of these connections, their internal nature, providing the organic dynamics of various systems of the overall process.

Keywords: organic communication, systematization of knowledge, special science, miatematics, didactic principle.

Introduction

The implementation of organic relations between school and university is of particular importance in the study of special subjects. In general, integration between school and university aims to ensure the connection between the knowledge, skills and abilities acquired by students in learning a specific academic subject. This connection must ensure a more in-depth study of mathematical facts and laws in the teaching of mathematical sciences at universities, and their future development [1].

Pedagogy refers to the indirect learning of the implementation of didactic principles in the teaching of special subjects in higher education institutions[11]. In other words, how the teacher implements coherence in the teaching of special subjects becomes an example for the future teacher to imitate in his future professional activities. Thus, this is the characteristic of the implementation of organic relations between schools and higher educational institutions of pedagogy. This feature is also relevant in the teaching of special mathematical subjects at school and university [2]. Based on the analysis of didactic literature, it is possible to draw a conclusion about the conditions

necessary for the successful implementation of harmonious relations between school and university in the teaching of mathematics:

1) To determine the level of mastering of students' knowledge, skills and abilities, general concepts in the sections and subjects of the school course necessary for learning mathematics;

2) Generalization and repetition of students' mathematical knowledge, which is necessary for studying university mathematics courses and learned by them at school;

3) Introducing problems from school courses of mathematics into the system of problems and examples when performing independent work and practical training;

4) Elimination of existing gaps in students' knowledge of the school mathematics course necessary for learning subjects[12].

Organic communication and systematization of knowledge are important in the educational process. The principle of integration is directly related to systematization of knowledge. Systematization aims to establish a set of associations that ensure the integrity of the pedagogical process, to establish clear connections between knowledge, skills, and abilities, while coherence reveals the character of these connections, their internal nature, providing the organic dynamics of various systems of the overall process [3].

The goal is to arm students with a system of scientific knowledge, rather than providing students with scattered, disjointed knowledge (comprehensive curriculum). The content of education is realized through academic subjects, each of which systematically describes the foundations of the corresponding subject[4]. Different scientific theories start from the analysis of simple forms and relationships and end with more complex and advanced theory, that is, a logical system is considered, and thus the requirements of the principle of systematicity of knowledge are met.

In the educational process, systematicity is seen not only as a didactic requirement for education, but also as its result, that is, systematicity is also understood as a level of knowledge.

As a level of knowledge, systematicity is characterized by the composition of certain sets of knowledge, their hierarchy and sequence, that is, by understanding one piece of knowledge as a basis for others, only with a clear, defined perspective on this set [5]. Each body of knowledge can be presented in a different logic and sequence and mastered accordingly. This understanding depends on how this set of knowledge is presented to the students, it is explained according to the purpose, and it is related to the next set of knowledge.

Thus, the subject of study can be presented in a variety of ways, based on the starting principle of a complete description of the course or subject.

Systematicity can be considered as a level of knowledge distinct from systematicity, and the principle of systematicity can be included in the more general principle of system. That is, systematicity is such a quality of a set of knowledge that it characterizes the existence of structural connections (structural connections) in the student's mind that are adequate to the connections between the knowledge of scientific theory. Systematicity is a level of knowledge that characterizes the existence of content-logical connections between individual components of knowledge in the student's mind [6]. With the development of the science of pedagogy, the content of the concept of systematization of knowledge was expanded and clarified. In the modern interpretation, the systematicity of knowledge is one of the main goals of education and an important condition for the effective organization of the educational process.

Systematization of knowledge in the conditions of an educational institution is a type of educational activity of teachers and students, which is manifested at all stages of the educational process and is aimed at students' acquisition of systematic knowledge. Since the principle of system organization is different, the systems can also be different. Systematization of knowledge is based on all thinking operations, and primarily on analysis and classification.

In this understanding of the systematization of knowledge, it cannot be done instantly, it is absorbed into the entire educational process.

The highest form of systematization of students' knowledge is the formation of a scientific theory in which ideas, structural concepts, principles, and laws are clearly expressed. Studying theory as a system of knowledge is a long process that does not always end in school education, that is, it is not always possible to implement it in school. In our opinion, when studying special subjects in universities, it is important to focus students' attention on school knowledge, which leads to its logical result in mathematical courses. For example, the development of concepts about numbers and functional relationships is important in school mathematics courses. At school, the teacher of the basics of algebra and mathematical analysis is required to have a thorough knowledge of such concepts as limit, continuity, derivative, differential, integral. These concepts and objects are studied in courses in mathematical analysis, functional analysis, and analytic function theory. Studying them allows the student to find answers to very important questions of school mathematics.

For example, if we take the derivative of a function as a basic concept, it is expanded to the level of special derivatives, derivative of a complex variable function in mathematics of higher education. But the essence of the derivation becomes clear

when it is generalized to the level of Banach spaces. Let's say, X, Y Banach spaces, U collection X part and open set, $f: U \to Y$, $x_0 \in U$ let it be.

If the following condition is satisfied f' (is a linear operator whose domain of definition is X , domain of values is Y)

$f(x_0+h)-f(x_0)=f'(x_0)h+o(h)$, here $\lim\limits_{h\to 0}\frac{o(h)}{h}=0$ if available, f reflection x_0 is said to have a derivative at a point.

Derivative $f: R \to R$ $\lim\limits_{\Delta x\to 0}\frac{f(x_0+\Delta x)-f(x_0)}{\Delta x}=f'(x_0)$,

speed $\vec{r}: R \to R^n$ $\lim\limits_{\Delta t\to 0}\frac{\vec{r}(t_0+\Delta t)-\vec{r}(t_0)}{\Delta t}=\vec{r}'(t_0)$,

special derivation $f: R^2 \to R$ $\lim\limits_{\Delta x\to 0}\frac{f(x_0+\Delta x, y_0)-f(x_0, y_0)}{\Delta x}=\frac{\partial f}{\partial x}(x_0, y_0)$,

A derivative of Gato $\lim\limits_{t\to 0}\frac{f(x_0+t\delta)-f(x_0)}{t}=f'(x_0)\delta$ variation,

$f: R \to R$: $f(x)-f(x_0)=f'(x_0)\Delta x+o(\Delta x)$ derivative,

$f: R^2 \to R$: $f(x)-f(x_0)=(\nabla f, x-x_0)+o(|x-x_0|)$ gradient,

$f: R^n \to R^m$: $f(M_0+h)-f(M_0)=A(M_0)h+o(h)$, $h\in R^n$, $A: R^n \to R^m$ Jacobi matrix,

$f: C \to C$: $f(z)-f(z_0)=f'(z_0)\Delta z+o(\Delta z)$ Complex derivative,

$f: X \to X$, X - Banach space:

$f(x_0+h)-f(x_0)=A(x_0)h+o(h)$ Derivative of Freshe

Now, if $X=Y=R$, then f' - of the derivative of a one-variable function x_0 value in point (number); if $X=R^n$, $Y=R$ if, $f'=\left(\frac{\partial f}{\partial x_1}, \frac{\partial f}{\partial x_2}, ..., \frac{\partial f}{\partial x_n}\right)$ - f of the function x_0 gradient at a point; if $X=R$, $Y=R^n$ if, f' - vector-column, whose components consist of derivatives of appropriate functions; if $X=Y=C$ if, then f' - complex number; if $X=R^n, Y=R^m$ if, f' - consists of the Jacobian matrix.

$x_0 \in X$ at the point f' the existence of the derivative is only a special number $tg\alpha$, of the vector $\left(\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y}\right)$, of a complex number (which is also a vector) $\left(\frac{\partial u}{\partial x}, -\frac{\partial u}{\partial y}\right)$, of the Jacobi matrix $\left(\frac{\partial f_i}{\partial x_i}\right)_{ij}$, of the linear operator $A: U \to Y(x_0 \in U)$ means more than existence. This f to reflect x_0 shows that it can be approximated by linear reflection around a point. The possibility of replacing the reflection (function) with a linear reflection around the studied point represents the essence of the derivative [10].

Systematization will be successful only if the connection between the studied and previously acquired knowledge is always established. The studied material becomes the basis for the following topics, that is, perspective connections are established in learning and learning now and in the future[9].

Systematization of knowledge is considered as one of the means of implementing organic relations between school and university, and serves as a support and basis for future educational activities.

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