PEDAGOGICAL SOFTWARE USAGE IN FUTURE MATHEMATICS TEACHERS STUDY

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Introduction. The use of new information technologies in education is an important part of modern society informatization. This process develops the preconditions for the widespread use of computer technologies in teaching process. Nowadays, some higher education institutions, such as pedagogical universities, are attempting to involve a personal computer in traditional Mathematics teacher learning system. Despite the interest of researchers in the modernization of teaching, the problem of informational computer technologies (ICT) integration into the vocational education system of future Mathematics teachers needs more attention. ICT in the professional learning of Mathematics students are not used enough; and observation of educational practice shows that, despite the needs of modern society for a more active use of innovative technologies for educational purposes and the relevant recommendations of the Ministry of Education and Science of Ukraine, only certain Mathematics teachers are expedient and effective in ICT using in their professional activity. Therefore, it is important to find and study pedagogically meaningful methodological ways of improving the educational, methodological and informational and educational support of professional learning of future Mathematics teachers using ICT.

Aim. The main purpose of the article is to consider the problem of ICT using in Geometric study of future Mathematics teachers on the example of software

"Integrated learning environment "Analytical geometry"". It corresponds to course's curriculum and contains sets of program modules that form a teacher's and students' workplaces. This architecture enables the teacher to teach effectively in a computer classroom with a local or global network.

Analytical Geometry Learning of Future Mathematics Teachers Using Pedagogical Software. Geometry is very important in the mathematical learning of future Mathematics teachers. The "Analytical Geometry" course should give the scientific ideas and methods of analytical geometry, its place among other mathematical disciplines; promote the mastering of knowledge and skills that enable students to get a qualitative education. In order to eliminate formalism in students' knowledge, lack of skills, the course features should be considered. Thus, the determining factor for the discipline is the method of learning, as well as the need to operate a variety of character and symbolic tools. In addition, there are different approaches to course's structuring, and its basic concepts defining. For better educational material mastering, teacher should form system. Only systemic knowledge allows showing flexibility, critical thinking, ability to evaluate new facts, new ideas, learn a certain Geometric object from different points of view.

It is known the system knowledge comprehended by the student as a non-linear knowledge grouping obtains a compact, expanded form in the completed form. It is revealed that the "Analytical Geometry" knowledge can acquire the qualities of the system if the following are formed: theory structure knowledge, types of connections between its elements; generalized special subject skills; abilities to construct a systematic presentation of material according to a certain scheme; abilities to develop different patterns of presentation. The criteria and levels of students' systematic knowledge formation in "Analytical Geometry" course are distinguished: the first level is a factual systematic system, the second level is a local systematic system, and the third level is a methodological systematic system. There are three main stages of the system knowledge formation in "Analytical Geometry" course. At the first stage, the elements of system knowledge within the educational topic are formed, in the

second stage - system knowledge within the content module, and in the third - system knowledge within the "Analytical Geometry" course.

The main peculiarity of educational modern system is the clear structuring of learning content. At content constructing of the "Analytical Geometry" course, the following conditions of integration of components of discipline's educational topics should be taken into account: the research objects should be connected; the same research methods should be used at teaching the main topics of the discipline; the study should be based on general theoretical concepts. Learning objectives that provide the formation of necessary knowledge of future Mathematics teachers should be defined at the beginning of each module.

During the course, students develop the specific skills necessary for further professional activities: the ability to think correctly and clearly, to achieve the full value of reasoning, logical thinking, clarity of mathematical reasoning and the ability to make logical and methodological analysis. The modular program of the "Analytical Geometry" course is designed so that the content of module's educational material ensures the didactic goal's achievement. Each module contains components of educational elements. The specific goals of modules provide a clear presentation of final result, the content learning formation, ensuring the mastering of knowledge and skills, as well as feedback. The components of each module are separated and interconnected.

The content or educational module is a part of the course; it has independent significance and contains several similar topics or sections. Each module is distinguished by a set of theoretical and practical tasks of the content, and control forms. At educational module the mastering of material is in the active independent activity. Therefore, in order to ensure the purposeful and organizational independent work of students, it is necessary to carry out the appropriate final classes, tests, etc.

So, it should be noted in the structure of each module there are three main components: theoretical, practical and control-assessed. The theoretical part is directly determined by the content of the lectures, the practical part - by carrying out the practical and advisory classes provided by the curriculum, and the control-

assessed includes control of the input, current and final knowledge. The curriculum considers the correspondence of the content and amount of components of the educational material to the relevant plans and discipline's work programs, selected concepts fundamentality, their importance for further professional activity, cross-curricular links in the structure of discipline, availability of educational material for students within the study of one topic. The main attention should be paid to the subject skills formation. It is directly related to students' Geometric skills acquisition, their classification, location and role in Geometry study.

The main purpose of the pedagogical software "Analytical Geometry" is to reveal the theoretical foundations of modern Analytical Geometry on the basis of the unified system of all theoretical and practical material, to form practical skills necessary for analysis, research and the applied problems solving, to assist the teacher in the differentiated approach implementation, to promote more complete and deeper educational material mastering by students. Learning the course using pedagogical software, students master the following knowledge: basic definitions, theorems and practical usage; basic mathematical methods for solving problems in "Analytical Geometry" course; proof of the important theorems on which the mathematical methods are based.

Traditional learning forms are lectures and practical classes. There is a workplace depending on user's category to organize the appropriate learning form in pedagogical software. It is determined by the previous personalization procedure after launching the program. According to the category, there is the transition to the workplace of the lecturer or teacher, depending on the type of lesson (lecture or practical) or to student's workplace. The workplace of each category of users contains the following modules-components: textbook, arithmetic, base notes, analytical tasks, lectures. The shift to the corresponding module is in the main workplace's window.

Base notes are slides of the brief theoretical information on relevant course issues. There are such base notes: the coordinate method, the line equation, the second order lines, the second order line classification, the lines equation in polar

coordinates, the elements of vector algebra, the line equation on plane in space, and the second order surfaces. The method of step-by-step explanation with the ability to go back and go to the current step was chosen as the basis for teaching the material. The lecturer has the possibility to control over the theoretical material teaching and, if necessary, to return to certain aspects that were not well understood by students. In addition, depending on the educational goal, the developed notes are classified by types: note-definition, note-algorithm for solving the problem, note-example of the simplest analytical problem usage, note-graphical construction. The combination of types of notes in the theoretical question teaching gives possibility not only to deepen the teaching material understanding, but also to visualize theoretical geometric concepts.

The online textbook contains "Analytical Geometry" educational material; it is relevant to the curriculum. The textbook material is presented in several sections; each one has titles and numbers and contains several paragraphs. The paragraphs also have names and numbers. Thus, the theoretical information for each question is organized in a structure that allows navigating and searching for necessary theoretical question using the software navigation options.

Let's consider the methodological aspects of pedagogical software "Analytical Geometry" use in conducting lectures for future mathematicians. The main didactic purpose of the lecture is to provide an oriented basis for further educational material. Lecture is the leading, main learning form. Lecture is an indispensable learning form because it does not repeat the textbook, but complements it with the latest science data, life facts, personal understanding and attitude towards taught material.

The developing of the lecture is complex work; it requires the teacher's patience, perseverance, creativity and excellent knowledge of the material. To develop a successful lecture the teacher should follow the certain rules and design the lecture consistently, step by step. Teacher should choose a topic and define the purpose of the presentation, then compile the bibliography and select literature, construct a lecture's plan and text, work on the form of presentation. At the lecture, it is especially important to make psychological contact with the audience, capture

students' attention and thinking. However, there are some weaknesses in the lecture that limit its ability to manage students' cognitive activity: relatively less student activity than in other learning forms, the inability of individual approach in the audience, feedback complexity etc. However, these weaknesses are offset by other learning forms. In the integral system of learning forms and teaching methods lectures play the most important role that can be realized only by this learning form. The lecture has a profound educational influence on the students in terms of content and personal communication of lecturer and students.

Let's examine the possibilities of pedagogical software "Analytical Geometry" use in teaching a lecture course. The scheme of using it is based on two important principles -modularity and interconnection. Modularity means the learning system consists of individual blocks, which are subdivided into components and they are part of the general block. These blocks have a clear structure, isolated from each other, but at the same time are interconnected. The main purpose of the construction is to provide opportunities for common system development that can be improved and supplemented. So, adding new elements to an assembled structure is simple and organic, without further functioning blocks modifying. It allows the system to function as a whole, using any system resource during operation. It allows to realize opportunities that are unattainable in traditional forms of educational process construction, and also to orient students for ICT use.

To construct a lecture on the relevant topic of the course, the use of the modules "Library of Base Notes", "Library of Analytical Tasks" and "Library of Lectures" are considered.

The available list of tasks fully corresponds to the course's curriculum for future Mathematics teachers and provides the opportunity to work out the skills of solving basic tasks in Analytical Geometry on practical classes and independent work of students outside the classroom.

Conclusions. The ICT implementation in the life can not affect the development of new foundations in educational activities. The ICT use in educational process organization, in particular, at conducting lectures and practical classes, allows

to overcome the main shortcomings of the traditional educational system (integration of students' individual characteristics, learning passivity, focus on memorization, but not on understanding of educational material), as well as intensify presentation of the material and its perception through the use of different types of information and perception channels. At using of pedagogical software in geometric problems solving, knowledge of general scientific methods of cognition and research is formed; the ability to interpret and analyze the results independently increases; cognitive abilities developing through the conscious use of cross-curricular communication; new material is assimilated; a knowledge system is formed in the minds of students, it ensures the system principle realization. Increased students' interest in information technologies, the ability to self-manage software options stimulates cognitive interest and forms a positive attitude to the learning process. The geometric concepts visualization implements the principle of visualization, reveals links between the theoretical concepts and the geometric interpretation. Students develop qualitatively new professionally skills needed for successful professional teacher's activity.

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