METHODOLOGY OF DEVELOPMENT OF INDEPENDENT LEARNING PROCESSES IN GEOMETRY TEACHING

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Annotation

This article highlights issues related to organizing independent learning in the teaching process of geometry, based on students' individual and reflexive experiences. It discusses didactic games and problem-solving approaches aimed at shaping and developing skills. The article emphasizes the clear representation of problems on diagrams, various methods of utilizing different tools, as well as the integration of information communication tools and conceptual recommendations to address related issues. The establishment and implementation of independent learning processes in geometry, based on the paradigm of personalized education trends, and the organization of geometry lessons using technologies for shaping and conducting lessons according to students' individual preferences and connections with interdisciplinary areas are also discussed.

Key words: independent learning, method and means, diagram, interaction, information communication tools, didactic games, personalized education.

It is important to increase the level of inclusion of young people with mathematics education by introducing the integrative principles of teaching mathematics in educational institutions in the world, by establishing personnel training in new and high-demand specialties in the educational market. is gaining importance. It is important to develop the mechanisms of integration of mathematics and production, to put it into practice, to individualize independent education, and to develop tools and technologies of the distance education system, to create programs with the help of modern information technologies. In this regard, it is necessary to ensure the integral connection of scientific research in the field of mathematics with production, to develop effective methods aimed at solving problems in the field of mathematics, to develop the competence of independent education by forming an individual educational trajectory of students.

A number of scientific studies on improving the quality of teaching mathematics in educational institutions worldwide, introducing modern teaching methods into the educational process, selecting talented students, training competitive specialists for the labor market, developing scientific research and innovations, and focusing on practical results. research is being conducted. In this regard, it is important to improve the technology of organizing and conducting independent work of students by using electronic manuals and virtual laboratories, and designing an innovative model of managing the independent educational process of students based on a reflexive approach. Scientific methodical foundations of teaching mathematics in Uzbekistan improvement, achieving an innovative approach to the use of modern teaching techniques and methods in the process of independent education is being considered as a priority.of the President of the Republic of

UzbekistanImplementation of additional measures to increase the scope and quality of scientific research in the field of mathematics, to create the necessary conditions for young scientists"[1] task is defined.Ensuring timely implementation of assigned tasksin order toIt requires the creation of modern textbooks on mathematics, the content of educational literature, covering the current level of science and technology development, sets of problems, manuals for performing practical work, multimedia programs. Provide educational institutions with modern communication devices, textbooks and other educational equipment, develop the potential of scientific organizations, organize their activities effectively, promote close communication and cooperation between the fields of science and production. requires to put in .

In scientific-pedagogical and psychological literature, the problem of forming the skills and abilities of students to think independently, to work independently, the situation of forming the skills and abilities of independent thinking and independent learning of students in higher education, the content of independent education, its organization Forms and types of doing, the role and importance of pedagogical and modern information technologies in organizing independent educational activities of students have been studied. Also, the role and importance of pedagogical and modern information technologies in the organization of independent educational activities of students is described [5].

To improve the methods of formation and development of independent learning skills of students in the process of teaching geometryto study the specific aspects of the processes of individual independent education, clarifying the practical components of independent learning processes, preparing electronic applications for independent work, and developing methodological support for independent learning:

identifying and improving the methods of using didactic games and puzzles aimed at forming and developing students' independent learning skills and competencies based on individual and reflexive approaches in the process of teaching geometry in higher education;

development of "Constructor" and "Puzzle" games through the pedagogical-content integration of drawing and imagination possibilities of geometry in students' independent education [1];

organization of various independent educational activities outside the classroom dedicated to the properties of geometry and interdisciplinary connections based on the principles of the person-oriented educational paradigm;

improvement based on the integration of information and communication tools and conceptual recommendations that serve to develop the skills and abilities of students to work independently in geometry.

Below is a sample of such puzzles.

Agree:

1. A curve belonging to a hyperbolic handle

4. Yanosh Bol'ayi asari.

6. Accepted sentence without proof.

8. The name of the equidistant in the corresponding stem.

10. Mathematician who solved the problem of continuity for the first time in its essence.

12. German mathematician who was one of the first to come to the idea that "postulate 5 cannot be proved".

15. Naming one of the order axioms.

16. Euclidean Asari.

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[1] Address of the President of the Republic of Uzbekistan Sh.M. Mirziyoev to the Oliy Majlis on December 29, 2020.

17. Author of Pangeometry.

18. At least two models of the system of axioms are isomorphic.

19. One of the ratios in Gilbert's axiomatics.

20. The author of the hypothesis "There are two similar but unequal triangles".

22. Group 4 axioms of Gilbert's axiomatics.

23. geometer who lived in the city of Miletus in the VII-VI centuries BC.
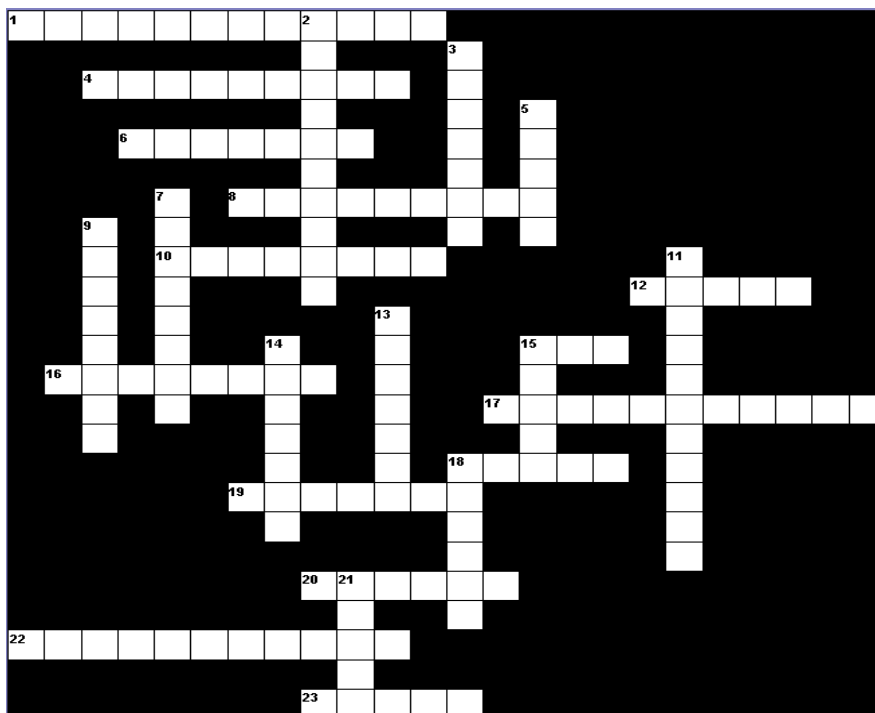
Height:

2. This is the field that books VII-IX of "Negizlar" are dedicated to.

3. [2d-(the sum of the interior angles of a triangle)] is the name of the difference.

5. Scientist who introduced vector axiomatics to geometry.

7. Aksiomatik method

9. The author of the work "Basics of Geometry".

11. Gilbert's 5th group of axioms

13. Naming of group 1-2 axioms of Weyl's axiomatics in modern geometry.

14. A scientist who conducted discussions on a rectangle with two right angles and equal sides.

15. The author of the proof "The distance between two non-intersecting straight lines is constant".

18. Gilbert's 2nd group of axioms.

21. It was the city where the science of geometry was most developed in the 4th century BC.

Students should combine their educational activities with independent work. The effectiveness of the training depends not only on the presentation of new material, but also on the ability of students to receive assignments and solve them independently. It is noteworthy that independent work is continued after training. Formation of students' independent activity in geometry is carried out in the course of training and in activities performed outside of training. This case shows the continuity of the education system. The importance of independent work in students' in-depth learning has been proven once again, and below is an example of such work.

Case. Introducing the system of axioms without contradictions, completeness, and freedom [3]

1. A system of axioms is created;

2. A model in which the system of established axioms is implemented is created;

3. The system of axioms is checked in the model and it is checked that no contradictory sentence is formed;

4. An axiom that contradicts an arbitrary axiom in the system of axioms is taken and a new system of axioms is created;

5. A model will be created and checked for the newly created system of axioms;

6. If no contradiction is found as a result of the check, then the first obtained system of axioms is uncontradicted and complete;

7. In order to check independence, it is checked that an axiom is not a consequence of another.

Tasks for completing the case:

Check that the system of Gilbert's axioms is consistent, complete, and free by building an analytical model.

In general mteaching independent thinking, the main didactic material of textbooks on any academic subject are texts, questions - tasks, exercises or examples - problems, cases.

It is not necessary to emphasize the special importance of textbooks, training manuals and the teacher in teaching the learner to think independently, but it should be supported by advanced thoughts on the subject, scientific conclusions, practical facts, events or it will be necessary to direct the person to express his attitude.

Therefore, independent education is considered a form of education for the purpose of strengthening acquired knowledge, skills and abilities, and independent study of additional information or materials.

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