

TECHNOLOGIES FOR DEVELOPING STUDENTS' COMPETENCE IN FRACTAL GRAPHICS

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Abstract. This article describes the structure and possibility of developing students' competence in fractal graphics. Also, in this article, a method of using the proposed structure is proposed.

Key words: fractal graphics, competence, problem-based learning, web quest, computer graphics.

Today, due to the use of fractal graphics in various fields and scientific research, there is a need to develop modern approaches to increase the motivation of students, develop their creative, cognitive thinking and competence [1-4].

Therefore, it is important to increase the motivation of students for fractal graphics, including the development of fractal images, and to improve the technologies for developing their creative thinking and competence. Because fractal images are created by automatically creating images based on calculations using special formulas according to a certain algorithm. Changing the values in the algorithms or the coefficients in the formulas causes these images to change. As a result, fractal graphics allow the creation of abstract compositions with the ability to implement compositional techniques such as verticals and horizontals, diagonal directions, asymmetry and symmetry. Also, fractal graphics are indispensable for creating images of surfaces similar to nature, mountains, clouds, water and other non-Euclidean natural surfaces. At the same time, fractal images are widely used in the design of advertising leaflets, information boards and websites. Turbulent flows are also modeled using fractal graphics and various patterns are created.

Taking into account the possibilities of fractal graphics, it is important to develop the competence of students. Therefore, within the framework of the study, a framework for developing students' competence in fractal graphics was developed (see Figure 1).

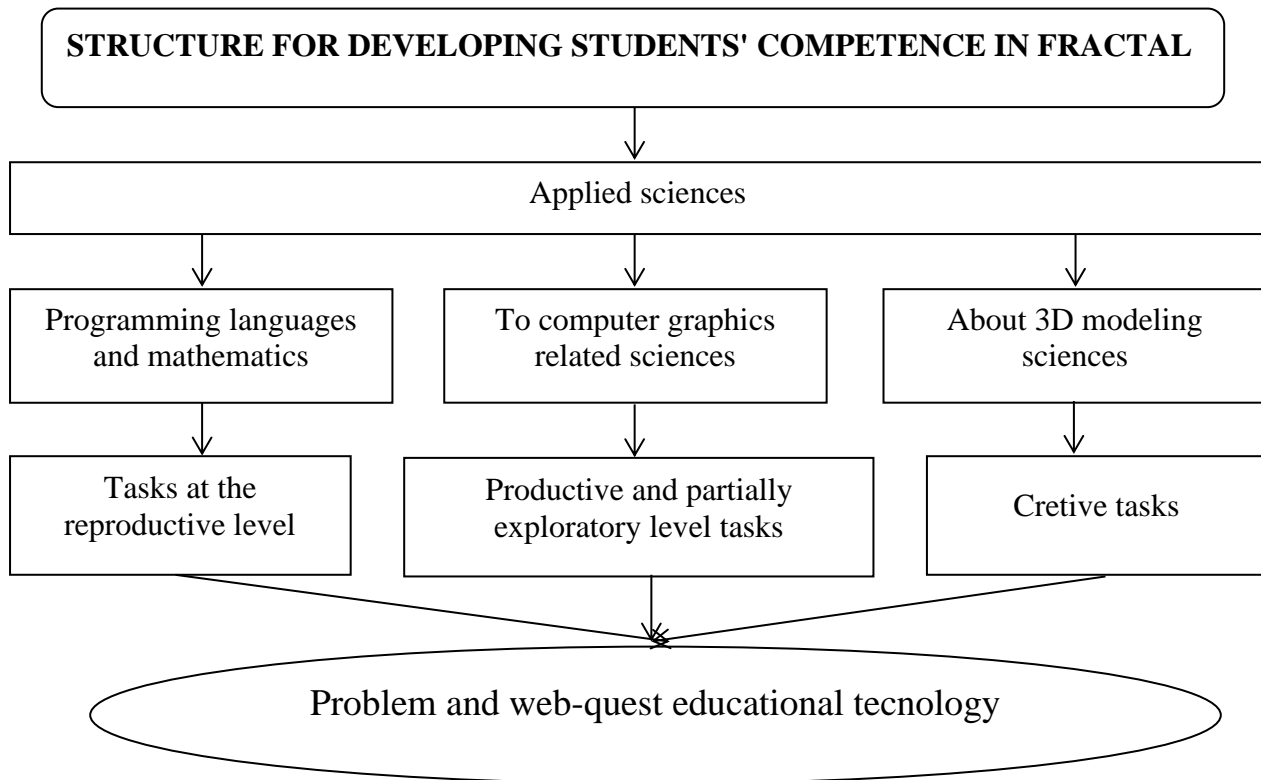


Figure 1. The structure of developing students' competence in fractal graphics

Based on the given figure 1, it is used in teaching programming languages to increase the motivation of students regarding fractal graphics. That is, when teaching the science of programming languages, tasks related to the construction of function graphs should be included in the content of the subject. Because in the analysis of the content of the conducted researches and the programming language curriculum in higher education institutions, almost no attention was paid to the construction of function graphs. That is, in the content of the science programs of subjects related to programming languages, it is mainly aimed at programming problems and performing various practical projects. This creates initial problems in the development of students' competence in graphics, including fractal graphics. Therefore, in order to increase the motivation of students regarding fractal graphics, it is necessary to increase the share of topics related to the construction of graphics in the content of programming language subjects and pay attention to their use.

In this, students will have ideas about constructing various graphs from the computer, based on learning how to construct graphs of two and three dimensions of functions using programming languages. Also, he is interested in the principles of computer arithmetic when creating graphs. As a result, students' motivation for fractal graphics begins to appear.

Also, in order to develop students' practical skills related to fractal graphics and increase their creative ability, it is necessary to include the use of fractal graphics programs, including the Ultra Fractal program, and the development of various graphic projects in the content of computer graphics subjects. Because according to the research conducted in higher education institutions, there are not enough subjects related to fractal graphics in the content of subjects related to computer graphics. Therefore, it is appropriate to include the development of projects using the Ultra Fractal program in the content of computer graphics subjects in higher educational institutions.

At the same time, in the development of students' cognitive thinking about fractal graphics, it is necessary to include the use of the XenoDream program and the development of various projects in the content of 3D modeling subjects. Because the XenoDream program allows you to develop various three-dimensional fractal projects.

It is proposed to use problem-based and web-quest educational technology to improve the effectiveness of teaching the proposed programs and to teach the development of various projects. In this case, it is appropriate to use problem-based learning technology in classroom training on computer graphics, and web-quest learning technology in organizing students' independent education.

Literature

1. Smirnova E.S. Methodology of education elementam fractal geometry kak sredstvo razvitiya issledovatel'skikh komentetsii budushchikh bachelorov // Avtoreferat dissertatsii na soiskanie uchenoy stepeni kandida pedagogicheskikh nauk. - Yaroslavl, 2013. - 24 c.
2. Gryaznova A.A., Zaitseva O.S. Comparative analysis program generatsii fractal graphic // International scientific journal. – 2015. – No. 3-2.
3. Kelly, Alice (2000). Methodology and fractal art. Computer graphics. 24 (4): 611–616. doi:10.1016/S0097-8493(00)00062-5.
4. Leys, Josh (June 2005). "Fractal inversion sphere". Computer graphics. 29 (3): 463–466. doi:10.1016 /j.cag.2005.03.011.