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Research Article

FORMATION OF COMPUTER VISUALIZATION COMPETENCE IN STUDENTS BASED ON A CLUSTER APPROACH

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ABSTRACT

In this article, the modernization of education in our country is aimed at improving its quality, achieving new educational results that meet the requirements of modern society. In many ways, this is aimed at developing students' competence in the field of computer visualization based on the cluster approach in education.

KEYWORDS

Competence, cluster, methodology, visual, modernization, functional, technological, interactive, heuristic, complex, matrix, didactic, ergonomic, technical, trends, interface, psychology, philosophy, sociology, pedagogy, illustration, models.

INTRODUCTION

The principles of constructing the methodology for the formation of competence are a necessary condition for the development of research logic and should be based on the general laws established by pedagogy and related sciences – psychology, philosophy, sociology, etc. At the same time, these principles should represent the specific laws of research. Thus, there is a need to impose restrictions on them, and this is done by introducing specific principles. The importance of principles in design practice puts them forward in the system of fundamental concepts [1].

The logic of constructing a methodology for the formation of visualization competence on a computer requires the formation of general requirements for the final result of training, based on which it will be possible to determine the principles.

In the context of solving the problem, such requirements should include:

- it is necessary to give preference to visualization technologies in mastering;

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• technologies must be developed, not implemented in a specific way, within the framework of a specific software package;

• software implementation should be available to teachers in terms of their presence, interface and basic methods of use in the educational institution;

• it is necessary to master not only visualization technologies but also the methods of using visual aids in educational activities using equipment.

The fulfilment of the listed requirements creates a technological and methodological condition for the formation of computer visualization competence, which determines the adequacy of the initial rules. At the same time, failure to fulfil any of the listed requirements leads to a complete non-formation of competence[2].

The need for compliance of educational results with the listed requirements also makes it possible to analyze various educational programs for the training of future teachers of Informatics and formulate the essence of their future professional activity in the field of computer visualization. There are several principles by which the methodology for the formation of competence based on the established OECD can be built [3].

1. The principle of basic functionality. All software tools for computer visualization have a fairly wide and versatile functionality, the full development of which, on the one hand, requires an unreasonably large amount of study time, while on the other hand, it becomes superfluous for the teacher to solve professional problems. In this regard, the development of only the main functions of the software should be ensured.

2. The principle of generalized development of technologies. Since the software for single-purpose computer visualization has the general principles of construction, a similar interface and functionality, the training content should include the study of generalized work methods that are carried out in different programs.

3. The principle of professional orientation of educational tasks. The content of the practical and theoretical material of educational assignments should take into account the peculiarities of the future professional activity of the future computer science teacher.

4. The principle of task variability. To master the proposed technology, it is enough to complete the main task. Solving development problems makes it possible to obtain more complete information about the object of study.

5. The principle of didactic expansion of tasks. In the preparation of future teachers of Informatics, it is necessary to provide tasks that are aimed not only at studying technological elements but also make it possible to assess the compliance of the obtained visual materials with didactic and ergonomic requirements.

6. The principle of cluster design. The lack of a strict size (meaningful size) of the cluster, even if there are significant differences in training, allows you to build the same type of training courses from the same spindle by changing the number and content of training tasks and the methods used.

Compliance with the listed specific principles should be considered as requirements (restrictions) that must be taken into account when creating a methodology for

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the formation of visualization competence on a computer.

Thus, the design of the methodology for the formation of computer visualization competence based on a cluster approach in future Informatics teachers should be carried out based on the general scientific, systematic and specific principles presented by us: basic functionality; generalized development of technologies; professional orientation of educational tasks; variability of tasks; didactic expansion of tasks; cluster design[4,5].

Based on the cluster approach, we can highlight the following stages of designing the methodology for the formation of visualization competence in a computer [2]:

Stage 1. Forming a groove. At this stage, educational and technological clusters are selected for mastering, depending on the didactic value of the product and the availability of technology for the teacher.

Stage 2. Determination of levels of development in the wood. It is envisaged to allocate several levels of mastering the pass, which, when developing a methodology for the formation of computer visualization competence, are selected based on the time of study allocated to it in the curriculum of the subject. The transition to the next stage is carried out after mastering the content of the previous one.

Stage 3. Cluster - science Matrix construction, planning the study time for each level of cluster acquisition. A table (matrix) is drawn up for the selected curriculum, the rows of which are OECD, and the columns are subjects that provide the study of visualization elements on the computer; the mark at the intersection of the row and column indicates that OECD is being studied in this discipline.

Stage 4. Identification and control of teaching content, and methods. At this stage, by the volumes of study hours specified in the cluster-science matrix, the content of the theoretical material is determined, a set of educational tasks is formed, and methods for solving them are allocated for each level of Mastering The Groove. At the same stage, the tools and methods for controlling the development of OECD are determined: to check the appropriation of theoretical knowledge, which, as a rule, is a computer test; checking the development of technology - tasks that require the use of "non - basic" technological techniques; for the didactic level-tasks of an interactive heuristic type.

By the established procedure, in this study, the construction of a methodology for the formation of visualization competence on a computer was carried out [6].

Thus, the formation of computer visualization competence in future Informatics teachers is carried out based on a cluster approach. The design and construction of the methodology for the formation of computer visualization competence should be based on general scientific and specific principles (basic functionality; generalized development of technologies; professional direction of educational tasks; variability of tasks; didactic expansion of tasks; cluster design) and should be carried out by the allocated stages (formation of an educational complex; distribution of development levels in the educational complex; construction of a cluster-science Matrix, planning of study time for each level, cluster development; identification and control of teaching content, methods).

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