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Research Article

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

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ABSTRACT

In this article, the modernization of education in our country is aimed at improving its quality and achieving new educational results per the requirements of modern society. This is largely due to the fact that the educational process is increasingly incompatible with social requirements.

KEYWORDS

Cluster, graphic, object, interactive, individual, visualization, ergonomic, didactic, technical, postindustrial, trends, technological, integration, pedagogical, illustration, models.

INTRODUCTION

The analysis of educational standards showed that within the framework of the training of teachers of Informatics, there is no single science that provides for the formation of the necessary professional competencies following the state educational standards of Higher Education and in various directions of pedagogical orientation. The list and size of disciplines involved in computer visualization technologies also differ. In our opinion, a possible solution can be the development of a certain number of alternative didactic units - educational and

technological clusters (OECD), by combining which it will be possible to build the desired course of study (or sequence of courses). [4].

The concept of "cluster" is widely used in Mathematical Statistics, computing, marketing, medicine, Mineralogy, economics and other fields and has different meanings:

- Cluster (English. cluster-bunch, harvest, category), a bunch of objects of the same type;

- Cluster is the sum of semantic units of a text that are graphically arranged in a swarm representation in a given order;

- A cluster is a union of several same-sex elements, which can be viewed as an independent unit with certain properties.

A.G.Zalyalova, G.V.Mukhametzyanova, N.B.Pugacheva, O.E.Yavorsky introduces the concept of an educational cluster, which is understood as a set of interconnected institutions of education, combined with cooperation relations with production and industrial enterprises in terms of Science and production integration.

A similar view is taken by T.P.Shamova [1], who defines the cluster as an organizational form of integrating stakeholder efforts in the direction of achieving competitive advantages: conducting research, educational institutions of all levels (Schools, Higher Education, and further education). The integration of topics should be carried out based on the mutual replenishment of experimental and scientific, as well as practical developments.

The research of N.Yu.Safontseva and A.G.Cherkashina focus on the design of educational programs based on the cluster method in higher education. N.Yu.Safontseva distinguishes the concept of a software cluster separately and defines it as a tool for software processing of structured curriculum and

factor analysis results in the diversity of all relationships [2, 30-b.]

In the above definitions, the cluster is explained from different points of view. In our study, we understand educational and technological clusters as a structured and semantically complete information and technological part of a methodological system, which includes the main content, teaching methods, a set of extensible educational tasks and methods for solving them. a generalized model of the structure of educational and technological clusters is presented in Figure 1.

The following points can be said about the presented model:

Traditionally, we can assume that the cluster has two planes: the plane of computer technology, the plane of content and the plane of tasks. The first plane contains basic information technology and additional elements necessary to complete tasks. In the plane of content and tasks, three directions are distinguished - the field of theoretical content, the tasks of technology development and the didactic tasks for which this technology is applied to solve. It is assumed that the teacher, using a certain teaching method, shows the use of the main capabilities of computer technology in the example of a professionally oriented task, compiled based on the main theoretical content of the cluster. [4].

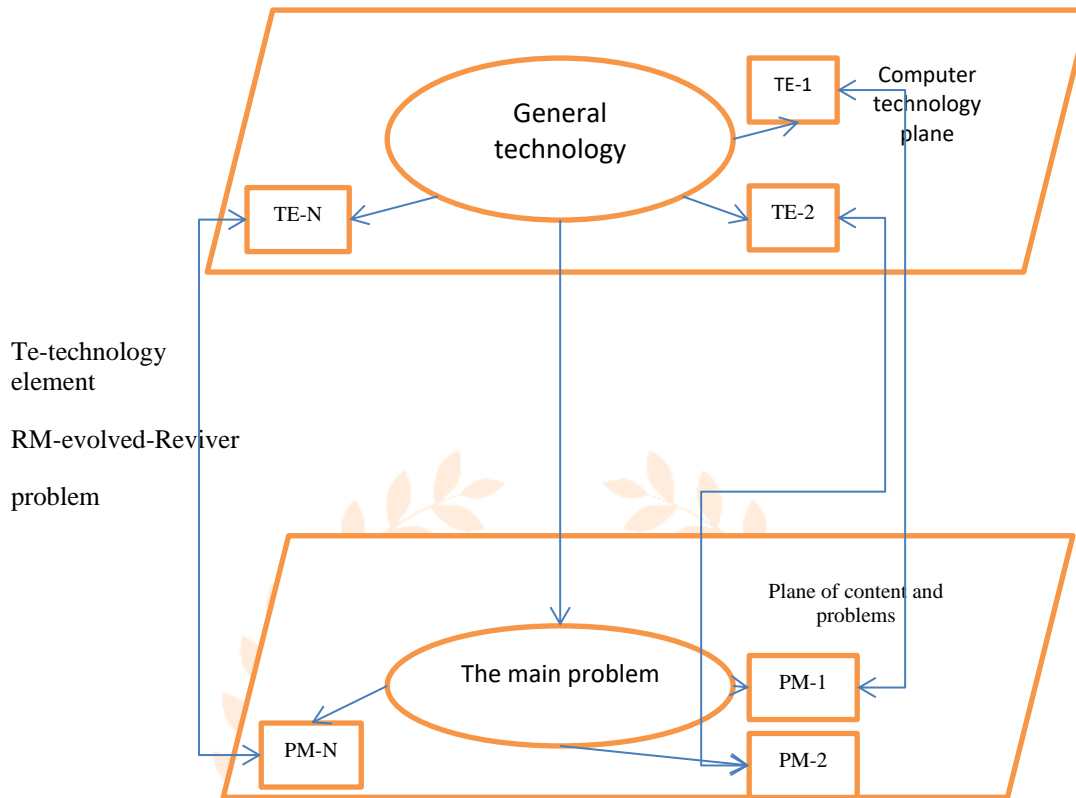


Figure 1. Generalized structure of the educational-technological cluster

In addition, to expand the main task, students are given assignments on a technological plan, in which they independently choose methods and, with them, master the necessary additional technological elements. Then, taking advantage of the opportunities of the studied technology, the student solves the tasks set by the teacher for the development of didactic materials. Didactic assignments based on interactive heuristic tasks make it possible to check the educational product created by students for compliance with generally accepted ergonomic, technical and didactic requirements (E.A.Bondarenko, A.A.Kuznetsov, I.V.Robert, N.V.Safronova). The total number and description of such tasks are determined by the allocated reading time.

Analysis of the studies shows that the cluster in education is considered from the point of view of the connecting component between different levels of education, the method of drawing up curricula and the

graphical method of providing educational material. The Organization of the educational process based on a cluster approach has not been noted by scientists.

It is worth noting that the proposed cluster approach differs from the modular one, which has already become traditional in teaching: the module, as a rule, covers a meaningful part of the educational material with input and output requirements; at the same time, the module does not characterize teaching methods, as well as the possibility of changing content (due to the specified output requirements). In the context of a large number of study plans, from our point of view, learning and technological clusters provide significant flexibility and opportunities to implement different study plans based on relatively few clusters. Thus, the use of a cluster approach ensures the formation of visualization competence in the student on a computer. [5].

In conclusion, it is important that the teaching of computer visualization technologies to students is carried out using the above steps in organizing the educational process. In this article, the modernization of education in our country is aimed at improving its quality and achieving new educational results to the requirements of modern society.

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