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Issues of Data Visualization in the Educational Process

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Abstract. This article discusses about visualization of information provided in the process of learning in the higher education system (lectures, seminars, theoretical materials for practical exercises).

Keywords education, information, lecture, theory, lessons.

Introduction

In addition to the structure indicated above, we reveal the specifics of the purposeful process of visualizing educational materials in the technical areas of higher education, which are reflected in the choice of production forms and teaching methods, as well as the corresponding visual learning data.

In pedagogy, the form of learning organization is interpreted as “a mechanism for adapting the learning process to the types of its disciplines, their tasks, as well as to the completeness of periods, structural units of learning” [2]. Algorithms for displaying information in visual education are added in the form of lectures and seminars on teaching information technology [3, 4, 5]. Methods for presenting visual educational materials in the technical direction of higher education, taking into account the structure of communication [6]. can be described in terms of interaction.

Main Part

Data visualization in higher education is carried out in the process of acquiring theoretical knowledge at lectures and developing experience at seminars and includes visual elements of educational and methodological materials corresponding to the following stages: updating knowledge, stimulating learning activities, providing new materials, performing both standard and problem tasks, and as well as monitoring and evaluation activities. The dynamics of visual elements, corresponding to the indicated stages, indicates the fulfillment of the previously formed requirement for ensuring the diversity of educational materials. At the same time, during the transition from one stage to another, for its further development, educational materials are presented in the form of a clear, visual and high-quality visual material that comprehensively reflects the theory and practice of the field under study. In addition, in order to better remember this information, it is necessary to find the expediency of repeating it in different contexts and ways, taking into account the degree to which the student audience achieves the learning goals associated with the dynamics of the formed experience. Accordingly, diversify the presentation of educational materials, the exchange of verbal and figurative-emotional information, suggest the use of previously studied and modified methods of visual teaching of materials grouped in such a way as to increase the effectiveness of the educational process in the application of technology.

In more detail, the methods of visual representation of visual education can be considered on the example of adapting educational materials to the specific characteristics of students, which refers to the process of processing and individual coding of educational materials described in terms of information. Individual learning (including individualized learning) in the literature is divided into three models of organizing learning [1]:

- 1) the teacher works with only one student;

2) the student interacts only with the textbook;

3) students interact with each other without the direct participation of the teacher. From the point of view of visualization of the educational material, it manifests itself in the coding of a specific educational material, the effective organization of feedback, the choice of the educational direction and adaptation to the specific features and advantages of the educational subject due to the speed of mastering the educational material.

At the same time, in a wide audience, visualization methods are selected based on universality and strict adherence to the logic of presentation. In individual lessons, algorithms can be used that take into account the individual experience of previously mastered visual activity. As an example of the practice of this session, the Trump Plan (USA) is a training organization that combines lectures with individual lessons in a wide audience using modern technologies. Dalton's plan - individual work in the form of cards, according to a special plan. The educator works with the audience in the introductory part of the lesson and sums up the results, which are evaluated individually for independent work.

In the conditions of work of educators, taking into account the intensity of information and the training cycle of a particular period, the duration of training sessions and the choice of ways to present visual training data, the necessary structural basis for visualizing educational material is created. Information. Full compliance with learning needs can be achieved through interactive learning, where active communication provides mobile management of detailed learning activities on a functional basis.

We observe the functional basis on the example of an interactive learning process, which is based on the passive interaction of subjects and the active exchange of ideas. This type of learning aims to develop critical thinking skills and includes actively searching for information, comparing it with one's own experience, and comparing it with other research in the field. The specificity of visualization is implemented in the process of searching, selecting, analyzing educational information depending on certain functions of educational materials (informational, flexible, compensatory, managerial, integrative, interactive, motivational, etc.). It is based on visual educational information (videos, models, drawings, diagrams, etc.), which reflects the thought process and is used at all stages of learning.

Conclusion

We will continue to identify specific features of visualization that are consistent with certain methods and techniques for visual presentation of visual educational materials. To do this, it is necessary to analyze the relevant methods of visualization of educational information aimed at identifying groups of teaching methods that correspond to modern scientific, fundamental and practical knowledge.

Such an analysis reveals the goals, essence, features of visualization, experimentally implements the pedagogical technology of visualization of educational information and allows you to determine the features of higher education in terms of practical methods and teaching methods.

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