GIS TECHNOLOGIES IN GEOGRAPHIC EDUCATION AND THEIR ROLE IN THE EFFICIENCY OF EDUCATION

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ABSTRACT

The current state of the problem of using GIS technologies in the process of training a geography teacher is analyzed. The development of the structure of educational and methodological support should take into account the achievements of the leading domestic pedagogical universities. Two main forms of cognition are known to modern methods: sensory, which is based on the sensations of perception and representation, and also logical, based on abstract thinking. Both of these forms are interconnected and cannot be separated from one another. Geographic information systems (GIS) allow collecting, storing, analyzing and mapping any data about objects and phenomena based on their spatial position.

KEYWORDS: *Geoinformatics; Geographic Information System (GIS); GIS Technologies; Digits Marketing Cards; Information Geo Complex ; School Geographic Information System.*

INTRODUCTION

The modern period of development of society characterizes the process of informatization, i.e. a global social process, the peculiarity of which is that the dominant type of activity in the sphere of social production is the collection, accumulation, processing, storage, transmission and use of information, carried out on the basis of modern computer technology.

The processes taking place in connection with the informatization of society contribute not only to the acceleration of scientific and technological progress, the intellectualization of all types of human activity, but also to the creation of a qualitatively new information environment of society, ensuring the development of the creative potential of the individual.

One of the priority directions of the process of informatization of modern society is informatization of education.

This proce ss incl yuchaet:

• improvement of educational system management mechanisms based on the use of automated data banks of scientific and pedagogical information, information and methodological materials, as well as communication networks;

• Improvement of the methodology and strategy for the selection of content, methods and organizational forms of training, corresponding to the tasks of the development of the student's personality in modern conditions of informatization of society;

• Creation of methodical system of training, focused on the development of intellectual potential of the student, the formation of skills to independently acquire knowledge, to carry out information and training, experimental o- research, various types of self-employment processing information;

• Creation and use of computer testing, diagnosing methods for monitoring and assessing the level of knowledge of trainees.

Informatization of education as a process of intellectualization of the teacher's and student's activities, which develops on the basis of the implementation of the capabilities of NIT, supports the integration trend of the process of learning the patterns of the environment (social, ecological, etc.), combining it with the advantages of individualization and differentiation of teaching, thereby providing synergy of pedagogical influence...

Our time - the age of computerization and informatization - provides a modern person with inexhaustible means of enhancing his intellectual capabilities, intensifying the processes of intellectual development of an individual, which allows initiating the development of certain types of thinking (for example, visual-figurative, theoretical); to intensify the processes of development of memory, attention, observation; to form the qualities of a leader capable of leading and organizational activities.

Of all the variety of pedagogical applications of NIT, the use of geographic information systems (GIS) should be especially highlighted in connection with their relevance in relation to geographic education and the ever-increasing popularity in the practice of domestic and foreign geographic educational process .

Despite many years of experience in using a variety of GIS for educational purposes, their potential capabilities remain not fully utilized and not fully exploited. Geographic information systems (GIS) for educational purposes are usually intended for use in the educational process, in the preparation, retraining and advanced training of personnel in the field of education, in order to develop the personality of the student, and intensify the learning process.

In the educational process, GIS performs the following functions:

• Clarity;

• educating and developing;

• Informational;

Visibility function. Two main forms of cognition are known to modern methods: sensory, which is based on the sensations of perception and representation, and also logical, based on abstract thinking. Both of these forms are interconnected and cannot be separated from one another. Visibility enriches the range of geographical representations of students, makes learning more accessible, develops observation, their thinking and cognitive abilities, helps a deeper and more lasting assimilation of educational material. The implementation of the didactic principle of visibility in teaching geography requires systematic work with teaching aids, including GIS .

Educational function. Working with GIS is characterized by increased expressiveness and emotionality, the ability to influence the feelings of students. By including various tasks for working with GIS in the educational process of students, the teacher during the seminars can solve problems of both ecological and geographical nature of varying complexity. One of the important tasks of the entire complex of work with GIS, which is one of the elements of modern polytechnic education, is graphic preparation. The content of school geography, along with knowledge, should include skills and abilities, stimulate the creative activity of schoolchildren. Increasing the role of emotional impact on students and their inclusion in assessment activities.

Developing function. The systematic, purposeful use of GIS contributes to the mental development of students. The implementation of the developmental function presupposes active work with them, the gradual, continuous complication of tasks. Mental development of students in the systematic work of GIS presupposes: at the early stages - to arouse interest in the object or phenomenon under study; the next stage is teaching the techniques of observation, analysis and synthesis of the observed, bringing students to conclusions and conclusions. Students work at this stage largely according to the model, in small groups at seminars. Only after the students have mastered the basic techniques of working with GIS, it is possible to proceed to the next stage - independent, creative problem solving, which is realized in the course of work on term or diploma projects.

Information function. It is realized through systematic work with GIS, which carry a significant semantic and informational load like any teaching tool. Depending on the specifics of the organization of work with GIS at the seminar, it can act as an independent or practical work, exercise, type of homework. All these roles are subordinated to a common goal: the formation of students' spatial ideas and concepts about the location of natural and socio-economic objects and phenomena.

The use of GIS in lecture material, materials from the Internet allows students to study geospatially referenced material much more efficiently using maps, space images, photographs, diagrams and graphs. Therefore, the process of assimilating new knowledge using GIS in the design and work with geographic information systems is more intensive and efficient for students. Geographic information systems (GIS) allow collecting, storing, analyzing and mapping any data about objects and phenomena based on their spatial position. This state-of-the-art computer technology enables the integration of databases and operations on them, such as their query and statistical analysis, with powerful tools for presenting data, query results, samples and analytical calculations in a visual, easy-to-read cartographic form.

These capabilities distinguish GIS from other information systems and provide unique opportunities for its application in a wide range of educational tasks related to the analysis and forecasting of environmental phenomena and events, with understanding and highlighting the

main factors and causes, possible consequences, planning strategic decisions and current the consequences of the actions taken, which is especially important for the ecological and nature conservation specialties of geographical faculties.

The use of GIS is important not only in the formation and development of the skills and abilities of students of the main general faculty stream, but it is also extremely important for the formation of vocational guidance, which is relevant primarily for student cartographers. The use of information technology allows teaching at a higher scientific level, integrating knowledge of the subject, and students feel like active participants in the learning process, acquire new skills, abilities, analyze, compare and be in a constant search for new knowledge. At the same time, the mixed mode of interaction “teacher-students " allows you to reveal and develop the creative potential of both parties, to work in cooperation.

The use of GIS in the classroom in geographical disciplines makes it possible to significantly optimize and expand the potential of the educational process, increases the cognitive interest of students in the subject under study, contributes to the general development of the personality, forms the geographical culture of students, and develops their creativity and imagination.

GIS technologies provide users with the ability to create, display, and analyze raster data. Rastro stems data or grid -data, especially suitable for displaying geographic phenomena continuous in space, that FIR like relef, precipitation, temperature, density awn population and other data that can be represented in the form of statistical surfaces. Grid data is also used to analyze various types of surface flows, for example, surface runoff, as well as changes in geographic phenomena over time. GIS support function of spatial analysis: ana lys proximity overlay eyny analysis and pro spaces ennye operation. Many sophisticated 3D and perspective display, modeling, and surface analysis functions are becoming available to geographers. In particular, GIS includes the ability to create and work with triangulated irregular grids (TINs). TIN - e the specific vector topology logic g th data model, most under hodyascha I to display and modelirova of the surfaces, creating a 3-D terrain models.

GIS technology provides the work with remote sensing data, which is today one of the chapters GOVERNMENTAL ist regular enrollment replenishment of new information of spatial databases in Geoinformatsionnyh systems and geo- graphy as a whole.

The need to use GIS technologies in the system of national geographic education is obvious. It is also obvious that GIS should be considered as one of the important innovative resources for the further development of the system of national geographic education. The priority area of activity in the field of GIS education should be the development of educational and methodological support, the development of the structure and content of training of specialists - teachers of geography in the field of GIS technologies. The development of the structure of educational and methodological support should take into account the achievements of the leading domestic pedagogical universities. It is expedient, in our opinion, to determine the leading software for GIS technologies on a competitive basis with the participation of geographers, teachers of pedagogical universities and teachers of geography. Along with the training of specialists, it is necessary to retrain and train geography teachers in the field of GIS education. This is the most important and more difficult task due to a number of reasons: the lack or lack of specialists who provide PC courses, problems with the acquisition of software products, the general insufficient level of computer literacy of current geography teachers, and others.

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