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PROBLEMS OF CREATION OF ELECTRONIC RESOURCES ON ENGINEERING GRAPHICS FOR UNIVERSITIES

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ABSTRACT

The article is devoted to creating electronic textbooks for teaching engineering graphics. The advantages and disadvantages of electronic textbooks, peculiarities of using electronic textbooks during the teaching are also widely opened.

INTRODUCTION

An intense development of science and rapid change of knowledge, coming of new technologies in distant fields, the usage of modern technologies in all areas including education process requiring to develop computerization and establishing information technologies in our republic.

Using information technologies during the teaching engineering graphics' course, developing its meaning, structure, teaching methods, creating new sources about engineering graphics are the most important directions of drawing and graph.

E-books or study guide is the new generation of information; it will help to harmonize traditional books with computer technologies and educational information's didactic trend. We can mention general and distinguishing peculiarities of electronic and printed books.

For instance, printed textbook is a book for pupils and students and source of studying are illustrated in the forms of text, sketch, diagram, table or picture. Special methodology, science, and technics, technology, political and cultural modern achievements should be taken into consideration while creating printed textbooks.

MAIN PART

E-book includes music, text, speech of speaker, colourful pictures and animations in it and this is a modern didactic system. The sources created in the field of engineering graphics must be included animations. Drawing and graph's themes are related with actions of space and learner should imagine them, and by leaning on his imaginations he/she must do graphical tasks. The students should have a good knowledge of space while studying the drawing and graph. This is one of the essential problems among student and teacher. The first reason of the problem is a knowledge of space's developing variously in each student, the other one is teacher's ability to develop students knowledge of space in a short time. These problems will be solved by e-books consisted of space animated model of the processes.

E-book and printed textbooks have the following generalities:

- Studying material is exposed exactly;
- Studying material is illuminated by basing on methodology, science and technology, social, political and cultural modern achievements;
- For providing textbooks' integrity, material must be exposed systematically;
- Textbook illustrates soluble logical, completed work in itself;

- To use expositions is very important in teaching drawing graphics course. Because drawing and graph demand to develop abstract thinking. Describing graphically is better in e-book than printed ones. E-books are supported with animations, voices, videos and other multi medias.

All types of e-books are characterized like the following:

- Studying materials are divided into parts, if you don't know any part it's impossible to catch up the whole idea of the material;
- There are questions after each paragraph to check students knowledge, without answering to these questions learners won't be able to learn the next material ;
- Student must be able to check his/her own answers, questions should enhance students' logic.

Any e-book must have the following peculiarities :

- During teaching reverse connection should be provided;
- Having possibility of individualized teaching condition;
- Using exposition while teaching ;
- Having a chance of searching information from different sources;
- Having opportunity of modeling materials learned by students;
- While teaching having possibility of testing students' knowledge;
- Existence of active method and styles teaching;
- Being carried out of studies in a high quality;
- Forming of knowledge and creating the possibilities of marking by themselves;
- Providing the connection between the lecture and practical training;
- Delivering the information by means of new form of multimedia.

The e-textbook must not be changed into an absolute informing source. The electron textbook must be created by taking into consideration of students' mental activities, his/her possibilities, especially, capabilities such as eyesight, hearing, imagining, similarly, it must make easier to remember knowledge and conceptions in high quality.

While creating the electron textbook the following aspects must be taken into consideration;

- Making foundation the methodic handbook of subject;
- Providing the integrity of teaching material;
- Systemizing the teaching material
- Conforming didactic principles
- Using from the animation productively and appropriately which may help to form knowledge and practices and schedules productively for compacting the teaching material
- Inserting practical exercises and control questions which directed at strengthening knowledge and practices
- Taking into consideration the language, contents of the electron textbook, which must be suitable for students' capabilities age and teaching environment
- Creating methodic practices for using the electronic textbook and etc.

For being productive e textbook must contain the followings;

- Studying material must be composed understandably and logically;

- Using animations and graphs have to be able to imagine abstract conceptions;
- Taking into consideration learners' age and physiological possibilities;
- Giving examples by taking into account different level of students

When creating electronic textbooks, design plays an essential role. It is known that in modern society designing activity is successfully applied in all sectors, including in the educational system, because a effective and accurate design choice positively influences the development of any industry.

We know that the term design, denoting a new kind of activity for the project of the objective world, arose in the early 20th century as a reaction to the spontaneous formation of visual and functional properties of the object environment. Currently, with the growth of computer technology, designing activities are accessible and has ample opportunities. Such prospects are efficaciously used in the educational system, for example, when creating electronic educational literature.

For instance, the subject of descriptive geometry is based on dimensional processes, their visualization, no doubt, requires designing approaches, because visual perception is very effective when the subject is interesting, proportional and convenient for the observer. On this basis, computer animation models (CAM) on descriptive geometry are created according to the following criteria:

- conveniently chosen angle;
- correctly composed composition;
- correct lighting;
- harmonious color scale;
- realism and visibility of dimensional processes;
- logical sequence of actions;
- logical completion of CAM.

Let's consider for example the creation of CAM of the combination method.

It is known that the rotation of a planar surface around its trace before alignment with one of the planar surfaces of projection is called the stitching method. The stitching method is a specific case of rotation, when the axis of rotation is one of the traces of the planar surface.

It is known that the graphical program **3ds max** has great potentials for creating various surfaces in particular the surface of rotation. For instance, in the **V⊥H⊥W** system, we select the **MN⊥H** axis and some flat curve **MCAKBN** as the formative surface (formative can be a straight or an arbitrary curve) of the rotation surface (Fig. 1). Rotating the curve of **MCAKBN** around the axis **MN**, we obtain the carcass of the surface of rotation (Figure 2). Each point during its rotation of the formative defines a circle, centered on the axis which is called parallels. The largest of these parallels, which describes the point **K**, will be the equator, the smallest gorge circle is that describes the point **A**. The curves that shaping the cross-section of the surface of rotation by planes passing through the axis will be meridians. Meridian **MCAKBN** parallel frontal surface projection, will be the main one. All meridians are equal to each other. The frontal sketch of this surface will be a meridian located in the frontal surface that is the main meridian.

Selecting how to form different curves, we obtain a variety of carcass surface rotation. For instance, spheres, cylindrical ring, ellipsoid, paraboloid, two-sheeted hyperboloid, etc. Choosing as a formative of a straight line one can obtain an identified circular cylinder and cone of rotation, a one-sheeted hyperboloid. From

the obtained surfaces of rotation, it is possible to create a variety of coverages for the construction of modern buildings.

As a consequence, creating computer animation models on descriptive geometry will provide advantageous conditions for the observer, which assists to the effective learning of the subject.

But e- textbook can be better than teacher, because live communication is efficient than technical means. Electronic textbook must be used reasonably. Using electronic textbook efficiently related with educators' skills.

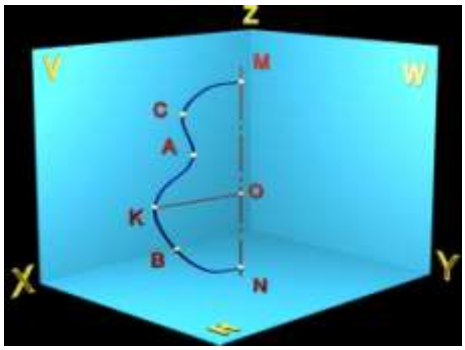

Fig. 1.

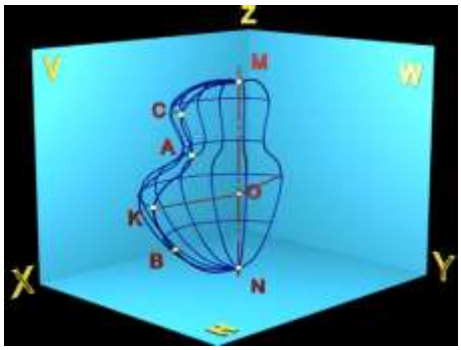

Fig 2.

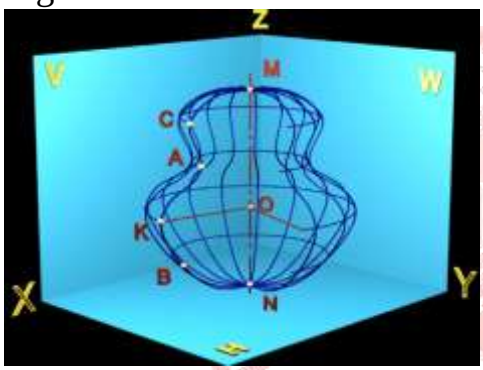

Fig. 3.

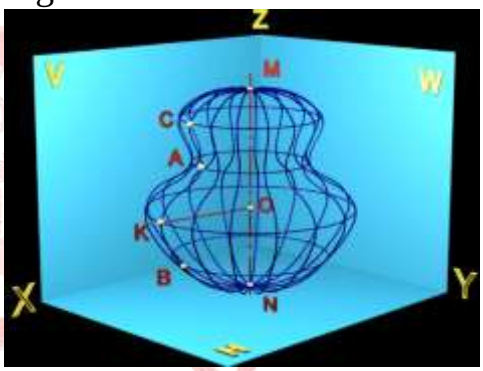

Fig. 4.

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