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Interactive Learning System

The learning system represents a specially organized knowledge net as a complex of logically connected elementary modules, which are combined into blocks, and "navigation system" which operates as dynamic table of contents. Modules can be created and located due to Internet elementary on any network node (server) independently of geographical location. They become available in on-line environment for every user, who has access to global net.

The new learning system that is located in global informative net includes: data base that contains indexed modules relating to definite area of knowledge; specially executive programs that allow to choose and complex modules in compliance with definite purpose; methodical programs that provide management of teaching process (optimization of learning order of chosen modules and blocs, control material digestion, teaching personification).

Module indexes guarantee their identification. It gives a possibility not only to choose training material for concrete user, but also to realize modernization of modules and blokes and to supply the database with newly developed modules. The Indexation of modules allows every user to work with the given system independently of his geographical location.

Executive programs meant for choice and interconnecting of modules should have definite variability, which will allow realizing of different methodical approaches by teaching.

Methodical programs that control the teaching process are realized as a "Methodical navigator". The navigator is built taking into account principles of programmed learning of Cram and supplies methodically competent learning succession of chosen modules and blocks. It suggests not only one or more trajectories of movement in the module net, but also realizes feedback, taking into consideration particular qualities of the user, and reorganizing first chosen path sections based on results of periodic testing.

The system has a great flexibility; it allows methodologists and pedagogues to organize personal schoolbook from elementary modules and blocks distributed in knowledge net

in different servers of the Internet.

The elementary modules and knowledge net blocks can be created and completed by dozens of authors and pedagogical collectives who work independently. The work of methodologists guarantees connection of the given modules and blocs in the knowledge net. As the module is a logically completed "elementary portion" of knowledge, the modification process of already worked out modules and blocks are simplified as well as permanent additions of the whole learning system.

In the Laboratory of Mathematical Modelling of Technical Systems the module "Pneumatics" was developed on the base of described concept of Interactive Learning system. It includes collection of multimedia learning pages and executive program. A multimedia page on "Pneumatics" is elementary unit of knowledge, an executive program navigates between units and enables to look through loaded learning page. Flash and XML technologies were used for creation of module "Pneumatics". Flash technology enables to create program-controlled animation, XML technology enables structuring and storing the information.

All multimedia learning pages are organized to groups: preface, base of pneumatics elements, schemes of pneumatics system and technical systems of pneumatics. Navigator is controlled by external XML-file which describes a structure of developed module "Pneumatics" by means of links between units. The advantage of such approach is easy rebuilding knowledge net on "Pneumatics" without recompilation of executive programs. Every multimedia page is described by the separate XML-file that contains text information and reference to animated simulation or interactive visualization. Thus, every page (and unit) has ability of easy tuning and editing. External CSS-files enable to change the style of developed module "Pneumatics" components.

The developed learning system is full of multimedia interactive educational information that is represented by animated simulations and interactive visualizations that help learners to understand and remember knowledge better.

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