The Possibilities of Exploitation of E-Learning in Technology-Oriented Courses

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Abstract

Developing trends in area of modernization of E-learning are mainly based on the technical possibilities of information and communication technologies. These trends supplement the distance learning implemented through E-learning about new possibilities of formation, presentation and distribution of curriculum. Information and communication technologies allow develop a new way of teaching for institutions, streamlining and modernizing the possibilities of study and become an important means to support teaching. E-learning modules serve as a complement to the comprehensive study. The paper is focused on the possibility of creating and using E-learning to support teaching of technologically-oriented courses at Slovak Technical University. Contribution describes the possibility of creation of E-learning and study support for technological course "Fundamentals of production technologies II" in an environment Academic Information System (AIS) STU. Contribution aims to determine the outline of the course, instructions on how to set up E-learning and subsequently prepare E-learning support, its individual parts and describes connection of support with the course and students. It describes in detail the creation of E-learning library and its E-objects that are part of E-learning. E-learning enables active use of video, images and tests.

Keywords: E-learning; E-object; E-learning support; E-learning project; technology.

1. Introduction

E-learning can be understood as electronic media supported of learning process. The E-learning system, which is considered to be a new didactic method, enables to provide education not only in a distant form, however there are new possibilities for other forms of education, as well [1]. American founder of the E-learning industry Eliott Masie defines the E-learning as a tool that uses network technology to create, distribute, selection, administration and continuous updating of educational materials [1]. The company "Urdan and Weggen" used in their study the term of E-learning as providing information, educational materials and educational content by using of various forms of electronic media - internet, intranet, extranet, CD-ROM, satellite broadcast, interactive TV [2]. E-learning is used as synonym for education supported by technologies TBT - Technology based training. Other companies, such as "Block and Dobell," consider e-learning as a subset of distance education, and this process is defined as the interaction between the students and the source of information who is physically placed in a remote location [4]. The way of using ICT resources and the availability of information materials depends primarily on educational goals and content, the nature of the education...
process, needs and possibilities for all the actors of the education process [5]. The issue of increasing the quality of the learning process using different methods of E-learning is currently the object of interest of many authors [6-19]. The problem is the absence of development of AIS STU E-learning in methodic. The aim of E-learning is to have the skills and knowledge to be useful in the job or can helping individuals to achieve personal learning goals [3]. Contribution describes the possibility of creation of E-learning and study support for technological course "Fundamentals of production technologies II" on bachelor study degree in an environment Academic Information System (AIS) STU.

2. The process of creation and implementation of E-learning in the AIS STU

2.1. Scheme of creation of E-learning in AIS environment

Schematic design of process making E-learning is shown in Fig. 1. It is a graphical representation of each step in the creation of E-learning courses in the AIS environment. Schema contains guide on how to establish E-learning and subsequently prepare E-learning support. The library is designed to store of particular file used in E-learning project. Uploaded files are, for example, different texts (e. g. PDF), animated images, videos and sound records.

The project distinguishes three types of libraries:

- The personal library of E-learning objects - objects that can be used for example in tests, only for personal use.
- Project library of E-learning objects - objects related to specific projects and objects may only be used by persons who are directly connected to the project.
- Public library of E-learning objects - objects who are defined as public, so they are available to the general public

After entering to the folder can be added to the library various "sub-folders" containing individual objects and therefore can be categorized each other.

![Scheme of creation of E-learning in AIS environment](image)

Fig. 1. Scheme of creation of E-learning in AIS environment
2.2 Structure determination methods of machining

At the beginning of the creation of E-learning it is necessary to create an outline - chapters of the course to be found in E-learning. Subfolders in the E-learning library will have the name of each chapter in E-learning support. Machining technology, for example, for grinding, it may be characterized by the following points:

- Process characterisation
- Kinematics of grinding
- Dynamics of grinding
- Basic methods
- Formation of chips
- Grinding tools
- Toolholder
- Workpiece clamping
- Machine tools
- Surface quality
- Wear and dressing of grinding tools

3. Course and e-learning condition, course structure of grinding

3.1 Create of E-learning project

The E-learning in AIS can create the registered user only. Created project can be made available to the whole university or only for a specific course. The project can be establish using the application eLearning projects (Fig. 2). Basic information about the created project is shown in Fig. 3. The project is prepared to teach in the Slovak language.

![Fig. 2. Menu for establish of E-learning project](image)

<table>
<thead>
<tr>
<th>Project title:</th>
<th>E-Learning of selected studying themes - Fundamentals of production technologies I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator:</td>
<td>Ing. Jana Moravčíková, PhD.</td>
</tr>
<tr>
<td>Project description:</td>
<td>Study support of the course Fundamentals of production technologies II</td>
</tr>
<tr>
<td>Language:</td>
<td>Slovak</td>
</tr>
<tr>
<td>Department:</td>
<td>Institute of Production Technologies</td>
</tr>
<tr>
<td>Protected by password:</td>
<td>yes</td>
</tr>
<tr>
<td>Project status:</td>
<td>upcoming</td>
</tr>
<tr>
<td>Project start date:</td>
<td>14. 02. 2016</td>
</tr>
<tr>
<td>Number of workers in the project:</td>
<td>4</td>
</tr>
<tr>
<td>Number of tasks in the project:</td>
<td>0/0</td>
</tr>
<tr>
<td>Number of documents in the project:</td>
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<tr>
<td>Number of projects in the projects library:</td>
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</tr>
<tr>
<td>Sample tests designed for the project:</td>
<td>0</td>
</tr>
<tr>
<td>Number of questions in test base:</td>
<td>30</td>
</tr>
<tr>
<td>Supports designed for the project:</td>
<td>9</td>
</tr>
</tbody>
</table>

![Fig. 3 Basics information about created project](image)

For E-learning was created the library of E-objects. The structure for technology characterisation was described in chapter 2.2. Into created sub-folders can be loaded various objects and files which will complement E-learning project. Fig. 4 documented the example of created subfolders for grinding technology.
After entering to subfolder is possible to add the required E-object. For example, to subfolder “Basic methods” were continually added 11 E-objects (pictures) which name defines the content of each E-object (Fig. 5). Next were prepared and added 5 videos, which documents the basic grinding methods.

After adding all required E-objects, user can show the preview of object number in subfolders by “Tree of folders” (Fig. 6) which can be used for quick and simple orientation of created project. The “Folders tree” shown the all subfolders of project and number of inserted E-objects in individual subfolders.
3.2. Development of study support

The study support is possible create only after inserting all of required E-objects which is the E-support created. The study support contain interactive parts, such as glossary of terms, animated pictures and videos. Sample of prepared study support of part “workpiece clamping during grinding” is shown on Fig. 7. From the created E-learning support can be accessible progressively formed individual parts of the topics with are actually teaches or set up automatic publishing of the topics on the specified date.
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4. Conclusion

The aim was to create an E-learning project for the course Fundamentals of Production Technologies II. For the processing of support was used and processing using the machining many wedges cutting tool with undefined geometry of cutting wedge - grinding. Part of the course support was created using the E-learning in Academic information system of STU, in which was incremental added E-learning materials for students of the faculty which have teaching and testing character. Prepared project is ready to process and characterize other machining technologies, which are content of the course Fundamentals of production technologies II. To the E-learning for the E-learning project "Fundamentals of production technology II" were added 13 sub-sections - chapters related to grinding, one of which contained only links to videos from Youtube.com website and another test questions. Within the support, it is appropriate to establish testing test base too, that allows continuous verification of the acquired knowledge. Prepared support is implemented into education of the course. As a result, it was observed improvement in exam results from acquired knowledge.

5. Acknowledgements

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6. References


