

## Even in E-Learning is Important to Do Your Own Notes!

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### ABSTRACT

In the last decade is e-learning a standard part of the educational process at all types of schools - primary, secondary and high schools. When use e-learning can be achieved significant savings not only in terms of time as well as operating costs. However, e-learning is also often criticized. This is mainly due to direct absence of teachers. This is mainly due to direct absence of teachers (lack contact with him). This fact brings with it a range of following these problems, such as long response times in asking a question or impossibility to consult on specific issues. E-learning brings with it other, often - hidden problems, that in the traditional way of teaching we do not perceive. Since from year 2009 we try at to Department of Computer Science, Faculty of Natural Sciences, Constantine the Philosopher University in Nitra create modules for LMS Moodle, which could help students in organizing way of teaching process (module Interactive Element Stat, Module Emotion Recognition and others). The aim of the creation of modules is to support adaptivity in Moodle. Nowadays for the support of teaching process we designed and created module with a name Notes. The aim of this paper is to highlight the importance of creating their own notes in Moodle. The basic function of the newly created solution is to add comments to the study materials including highlighting text. The module allows users to edit notes, created and printed them together with study materials.

### INTRODUCTION

In the 21st century, the ongoing technological development has had an impact on all parts of people's lives, including education. Especially the growth of the Internet – in its beginnings it was considered a revolution, later an evolution in education. With the evolution of mankind, the education evolves, too. New technologies intervening in our everyday lives bring also new forms of gaining and exchanging of knowledge. Information flow was transformed from spoken word to knowledge exchange by means of information technologies. Nowadays, realisation of distance learning at the same level as classical learning, eventually as its complement, is nothing exceptional. Acute necessity to widely apply distance form of education results mainly from the socio-economical phenomena related to providing access to the education for all members of information society being created in recent years. In developing countries, it represents a tool for elimination of secondary analphabetism caused by prolonging of man's life and faster ageing of his knowledge (Jusczyk, 2003).

Organization of the distance form of study is not an easy task. It can be quite complicated, especially regarding the communication or rather the instantaneousness and promptness of giving the feedback to the students. One of useful methods of increasing the effectiveness of the learning process and quality of students' results is integrating the on-line content and learning management system (Cápay et. al, 2011).

A typical example is the case of academic education. According to Drlík and Skalka (2011), e-learning has become an increasingly popular learning approach at universities due to the rapid growth of web-based technologies. E-learning implementation at universities is a long-lasting and complicated process. This process has to overcome a wide range of internal and external factors influencing e-learning effectiveness and content quality resulting in stakeholders' satisfaction and acceptance of web-based learning.

In connection to active introduction of e-learning as an equivalent form of education to classical education process, new systems of education administration have been being developed over time under different names: Internet Based Training, IBT, Online Learning. Currently, we are talking mainly about learning management systems – LMS. Lin et al (2009) describe, that Learning Management System (LMS) plays a critical role in current pedagogy. Along with the concept of WEB 2.0, web has become an interactive platform for contribution and collaboration. Moodle open source LMS is one of the most popular learning management systems currently. In present-day education, it is essential to note that a transformation is taking place. Nowadays, students are constantly exposed to Information and Communication Technology (ICT), so teachers must also adapt to current students' needs and interests, having digital resources in mind. The rapid development of these technologies,

combined with access to content almost anywhere and anytime, allows learners to gain new experiences regarding learning in a variety of situations and not only in school settings (Luján-García & García-Sánchez, 2015). Internet learning environments are considered as individual and learner-centered learning environments as they contain multiple and rich resources and have an autonomous character which offers a flexible learning environment (Chu & Tsai, 2009). The e-Learning can construct an independent and individualized learning environment and break through the restrictions of the conventional learning (Wen & Lin 2007).

Many universities have adopted Learning Management Systems (LMSs) to offer teachers a range of pedagogical and administrative tools for supporting teaching and learning activities (El Mawas et al., 2016).

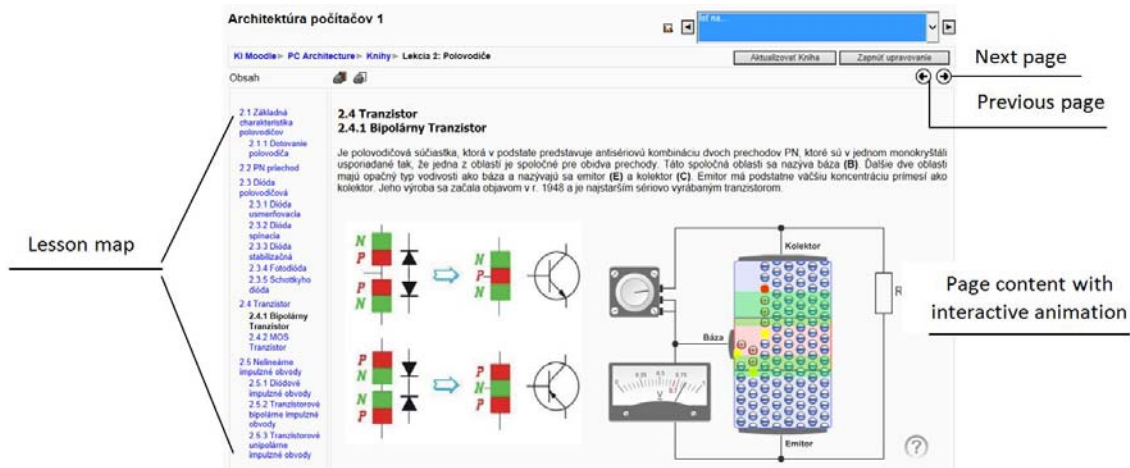
In education technological developments have had a strong impact on the behavior of learners and teachers as well as on learning and teaching scenarios. For instance, the availability of digital content and a constant internet connection have led to a reduction in the relevance of traditional textbooks (Lucke & Rensing, 2014).

### THEORETICAL BASIS

E-learning we use at Department of Computer Science, Faculty of Natural Sciences, Constantine the Philosopher University in Nitra since 2005. Of course we have also tried out various technological improvements, management systems. We were looking for suitable solution that would allow students to develop their cognitive and intellectual abilities. As the best solution we have chosen on the basis the analysis the system Moodle. It is used to actively at Department of Computer Science since 2007. We have a wealth of experience with him, because our priority is to provide study material for students in high quality and the ability to manage a personal method of teaching. In this way we try to contribute to the adaptivity in LMS Moodle. For us the priority is that the students should in study at the greatest convenience and could manage way of teaching process (in the form of the amount of received knowledge's). On the basis of previous ideas since 2007 we gradually developed a variety of modules for Moodle that to students facilitating the better and more comfortable use of this management system

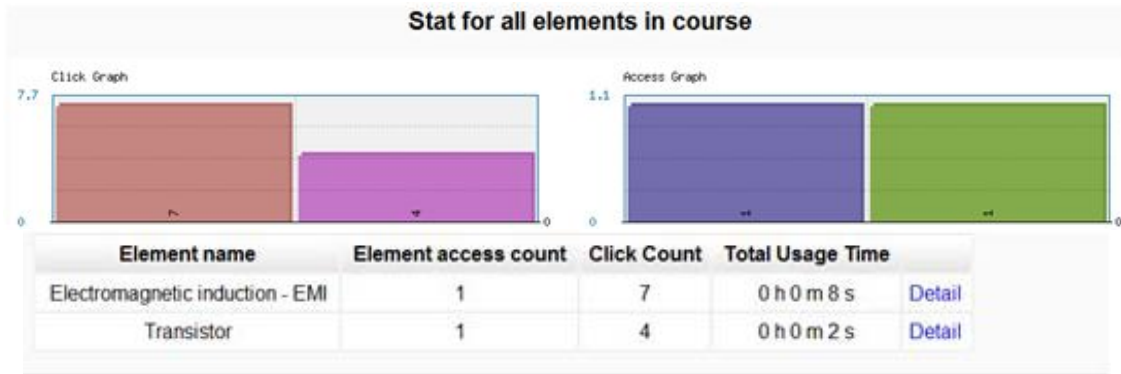
For example, in 2009 was created module IES – Interactive Element Stat (pozri Magdin & Turčáni, 2016 and Magdin & Turčáni, 2015), module LogicSimMoodle (Magdin et al., 2012) and currently now the latest module Emotions Recognitions.

The module IES is designed to capture activity of students when working with an interactive element that has been implemented in some of the lessons in LMS Moodle.



**Figure 1:** Stat Interface and typical content page created by the module Book with implemented interactive animation (Transistor), from original course in Slovak language.

It may be animation in format \*.swf, Java applications as well as interactive tests, in which is included the animation or simulation. An important factor in the design and development of this module was to determine how the various students working with interactive elements, and offer them an adequate solution for his problems.



**Figure 2:** Stat Results statistics and graphical evaluation Axis x: interactive element name, axis y: total number of accesses or the number of performed actions during the accesses.

In spite of all the positive factors that e-learning brings, we noticed the one important feature that revealed the use of IES module. By this is the loss of direct contact with the teacher. Often, opponents of this claim they say that contact can be replaced by other activities that Moodle offers us - surveys, discussion forum or private correspondence. The problem could be the speed of response to the answer that in direct contact with the teacher is very fast. Opponents they can argue of notification settings messaging on a mobile phone, which can ultimately accelerate next communication. But what in case if student looking answer to your question at 22.00 hour? How and when you get an answer to your question? The Opponents have for this problem also the answer - as soon as possible... But how we can explain the fact that students despite all well prepared materials with implemented interactive features (quality and effectiveness has been verified using questionnaire), the e-learning course have used only the minimum extent possible and prefer a printed study materials? This fact was confirmed in internal and external forms of study.

After analyzing the state of this problem and complex analysis of the responses from students, we came to the conclusion that:

1. Study Materials are prepared by high quality,
2. Study Materials provide enough interactivity,
3. Study Materials developed cognitive and intellectual abilities of students,
4. Study Materials combines the advantages of inquiry based learning,
5. Study Materials are available from any location,
6. Study Material is also possible to use offline,
7. Study Materials **not provide** direct contact with the teacher,
8. In the study materials **is not the possibility** of creating their own notes, which would temporarily replace direct contact teacher.

The last two points accurately characterize the resulting state. If the absence of direct contact students and teacher, the students prefer printing study materials and including your own notes. Then with these materials also looking teacher and jointly solve problems and seek answers to their questions. For this reason we decided to students facilitate their study process with following way - design and implementation of the module Notes. LMS Moodle already has a module Comments, but this module works on a completely different principle and does not provide possibilities for students how is labelling of study the text, as in the case of using the Notes.

### THE LEARNING ENVIRONMENT LMS MOODLE

Moodle is an acronym for „Modular Object-Oriented Dynamic Learning Environment“. It is the modularity of the system that shows unlimited options for its further enhancing. Adding necessary modules and enhancements into the system allows adjustment of the educational system according to our requirements and needs.

As standard functions in LMS Moodle can be considered the following modules:

- Registry and management of students,
- Registry and management of courses,
- Catalogue of teaching courses and objects,
- Management of study schedule,
- Registry of student assessment,
- Testing of students,
- Management of access rights,
- Communication tools,

- authoring tools for creating teaching courses and objects,
- Repository of learning content.

The modules can be inserted into different sections of the course (for thematic arrangement or weekly rate) or to the side of the block (in the discussion arrangement course). For add a new module is necessary enable edit mode. The basic division is to the standard modules and third-party modules. Standard modules are created Moodle developers. They are part of the installation system. These basic modules meet the requirements for full working with the system. Third-party modules are not included in the default installation of Moodle, but can be easily added to the installation. Currently of them exists a large number. Their number is growing and is updated every day. Their database is in the official website of Moodle.

Moodle from the perspective of modularity gives the opportunity to a wide range of programmers and enthusiasts to participate in the development of this system that is written in the PHP scripting language. Creating and adding new modules is very easy without interfering with the original system as a whole. For all these functions is an important requirement their portability and standardization. LMS should be open and able, for example, easily and quickly integrated tutorial content created before yet the introduction of LMS.

Every e-learning course is characterized by (Pavlíček, 2004):

- content and structure,
- educational goal,
- didactic function.

In the case of creating the content of the study material is often only active teacher. He has the right to add text, images, animations, sounds, and thus create a comprehensive study material divided into individual lessons. In our opinion, to the content of study materials have to say also students. It is similar as in the case of lectures where the teacher can raise a problem and then with the students find solutions.

## MODULE NOTES

Our aim was to create a module that would enable users in the role of student to create your own notes for study materials, save them and then with the study material printed. In order to implementation of this solution usable in practice, it is necessary to observe the following rules:

- creation of notes must be done intuitively, ie It should offer direct reading of study material in the form of comments,
- except text comments should be available functionality of highlight without creating notes,
- created notes as comments must be editable and removable,
- storing created Notes must take place at the user's request immediately after creating notes,
- view the notes in study materials must not be disruptive, the notes shown as comments upper the selected words,
- When you print the notes is need to maintain the integrity of the study material, notes are displayed in the form of indexed footnotes as in standard printed documents.

For our purposes we chose the type of module *Block*. This type of module is shown after the page margins, and thus does not disturb the user in study in teaching process, but it is always available for quick use. Module *Block* is usable in the study materials which contain text, graphics, and so on. By using intensive exploration of currently available options we evaluated that, for our purposes, is effectively and easily applicable open-source solution *annotatorjs*. This functionality uses a simple and transparent way of creation notes by using annotation of text and comments made. The presence of notes in the text of the study material is indicates shading the annotated text. After passing the cursor over the selected text appears to save the memo with the possibility of editing and deletion. Files needed libraries for correct functionality *annotatorjs* are freely available for download at github ( <https://github.com/openannotation/annotator/releases/tag/v1.2.10>).

## INSTALLATION AND TESTING MODULE

After programming module, you can proceed to install the system Moodle. In a simplified view the module installation consists of the following process steps:

1. compression of module directory structure into a ZIP archive,
2. login to the LMS Moodle under an administrator account,
3. open administrator sites, expanded menu *Plugins* and select an options *Install plugins*,
4. created zip archives with the module we insert into the dialog window and confirm installation,
5. system performs validation of module,
6. After successful validation is necessary to update Moodle database,

7. After these steps, the module can we fully use.

For to use this module Notes, we must activate its function through select Add Block - Notes. In this step is then possible to use the module for addition of comments such as similarly in Microsoft Word.



MAS English (en) ▾

## Poznámky v LMS Moodle

Dashboard ▸ PLM ▸ 11 March - 17 March ▸ Lekcia 1: Úvod do elektroniky

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### Lekcia 1: Úvod do elektroniky

#### 1.8 Vodivý materiál

Materiál, ktorý dobre vedie elektrický prúd. **Vodivý materiál sa rozdeľuje do dvoch tried: vodivé materiály** voľné elektróny. Keďže elektróny majú prakticky nulovú hmotnosť, elektrický prúd prechádza kovmi bez pre aj záporných iónov, t. j. premiestňovaním hmoty. Vodivé materiály možno rozdeliť aj z hľadiska ich použ najpoužívanejším materiálom na výrobu elektrovodivých častí patrí meď, hliník a zliatiny hliníka. Najdôležit

**Figure 3:** Select text in study material with the possibility of add comments.

After selecting a particular part of the sentence can be entered comment into the comment box.

## Lekcia 1: Úvod do elektroniky

### 1.8 Vodivý materiál

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**Figure 4:** Comments box with added comment.

If you confirm button Save, the comment is saved and the selected text is highlighting.

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**Figure 5:** Selected text with highlighting.

The module Notes is not compatible with lower versions of Moodle since version 2.9. This is due to the fact that the system itself uses from to version 2.9 different JavaScript libraries. The Moodle version 3.0 and higher uses jQuery library. In previous versions it was the YUI, which already is no longer supported. In a module whose implementation is based on javascript solutions is therefore easier to use principle jQuery library that has a prospect for the use of the module in the latest versions of Moodle.

Full-featured functionality and use of the module Notes has been tested in the new versions of the most commonly used browsers. The seamless and correct functionality module we can guarantee (on the basis of testing) in the following versions of browsers on those platforms:

#### Operating system Windows 7 (32, 64-bit)

- Google Chrome (Version 48.0.2564.103 m)
- Mozilla Firefox (Version 44.0.1)

- Opera (Version 35.0)
- Safari (Version 5.1.7)
- Internet Explorer (Version 11 Windows 7 (64-bit))

#### **Operating system Ubuntu 14.04 (32, 64-bit)**

- Chromium (Version 48.0.2564.82)
- Mozilla Firefox (Version 44.0)
- Opera (Version 35.0)

During testing, we found that when using the module in supported browsers Firefox and Internet Explorer is required interaction with user. Specifically, it is necessary to disposable browser settings - permission for printing color and background images in the settings to the printing of web browser. In Opera browser we found a restriction in the form of highlighting print in shades of gray scale. This shortcoming we can remove by printing the document to a PDF file, where the highlighting appears correctly with a preset yellow tint. A key aspect in the use of the module Notes is turned on JavaScript when we use the Internet browser. In the case when we manually disabled this functionality through your browser settings, the module will not work properly because the solution is based precisely on the use of JavaScript. The module Notes is available in English as well as Slovak locations.

#### **CONCLUSION**

Information and communication technology (ICT) can improve the operational processes of any business and the education industry is no exception (Stefanovic et al., 2011). As development in ICT field is progressing rapidly, it is crucial not only to sustain the correct trend in education by using modern tools but also search for and implement newest methods and forms of education. Kostolanyová states that, we live in a society in which information and communication technologies (ICT) are becoming a driving force for its development. E-learning is obviously a part of this (Kostolányová, Šarmanová & Takács, 2011). Electronic learning (e-learning) environments offer the possibilities for communication, interaction and multimedia material delivery that enhance learner-directed learning, especially in higher education (Stefanovic et al., 2011). However, literature shows that adopting e-learning does not guarantee improved learning. This is because mixing technology and the content does not necessarily yield effective learning (El-Ghalayini, El-Khalili, 2012).

From personal experience from projects along with classical teaching we can state that e-learning has its positives but also negatives. E-learning in current form is not possible to perceive as a creation of e-course which we can afterwards use several years. E-course is not a printed publication and thus it is constantly updated and innovated (Cápay et al., 2011a). Between the main positive aspects include e-learning form of study is available and accessible 24 hours a day. Each student has his/her own routines and is used to study in different time periods according to individual needs. In this paper we demonstrated the possibility of making notes in LMS Moodle. Creating your own notes for the students is an important step in education. By using these notes students can record their thoughts and practices and confront them with the ideas of the teacher. With this step we are combining the advantages of e-learning and traditional teaching. We believe that the module Notes will help all who use Moodle as a tool not only for provide study materials, but especially as a real tool for provide content and management of study materials with options adaptivity. Our idea is that students should have a feeling an active approach from the perspective of a teacher, as well as in terms of Moodle. Currently is performed testing for determination of efficiency of this module. We believe that the module can help learners to create their own notes on topics that interest them and allow them to develop their own ideas, opinions and insights.

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