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## eLearning ako mnohostranne použiteľný nástroj motivácie

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**Abstrakt:** Autori príspevku uvádzajú dôvody na vývoj vzdelávacích modulov s cieľom popularizovať výsledky výskumu a vývoja širokej verejnosti so zameraním na mládež. Ich záujmom je využiť potenciál eLearningu ako nástroja motivácie mladých ľudí, aby zvýšili ich záujem o vedu a techniku. Tieto vzdelávacie moduly budú voľne prístupné pre všetkých záujemcov na vzdelávacom portáli „eLearn central“. Autori využívajú pri tvorbe týchto modulov bohaté niekoľkoročné skúsenosti eLearn central tímu získané počas vývoja interaktívnych vzdelávacích materiálov. Úzka spolupráca s učiteľmi stredných škôl je pri vývoji týchto modulov nevyhnutná.

**Kľúčová slova:** eLearning, vzdelávací portál eLearn central, MOODLE, interaktívne animácie, motivácia

**Abstract:** In this article there are discussed the authors' motives leading to creation of educational modules in order to popularize the research and development results for general public with focus on young generation. They wanted to use potential of eLearning as a motivation tool for young people to increase their interest in Science and Technology. These eLearning modules will be free accessible on the educational portal "eLearn central". Authors use the rich experience with developing educational eLearning materials gathered by eLearn central team members over years. Close cooperation with secondary school teachers at developing of these modules is inevitable.

**Keywords:** eLearning, educational portal eLearn central, MOODLE, interactive animations, motivation

### 1 Introduction

Nowadays, we live in the Digital Age – rhetoric or reality? The amount of information which we need to absorb is accumulating day by day. In this process, the Internet, as an information source, has a dominant position. Especially young people prefer this way of obtaining information much more than other sources. An ordinary student prefers automatic search of information through the Internet to personal visit of a library, information centre or another institution. This new generation of students so called millennials (Oblinger 2003) (Tapscott's term for students born in 1982 or later), is attending universities today. These students expect to have an access to the same technology for education as they have now for other purposes - computers, cell phones, pagers, and PDAs. This group of people likes to be connected. They also prefer interaction to passivity; that is because their preference is for the Internet rather than television. The biggest difference between this current generation and previous ones is the type of technology they are familiar with. This generation is the digital group - the technology they grew up with is the technology we are getting used to as adults.

Likewise, humans are able to gain knowledge from their own experience. It is a well-known fact that learning by doing activates is 90% of earning knowledge. Interactivity in learning/teaching is the follower of a natural human feature – gamesomeness. Thus it is both effective as well as popular and consequently, it is widely used in education. By combining the Internet, interactivity and learning we get one of the most popular and progressive forms of education at the present time, well-known as eLearning. There are great advantages of this kind of learning over the traditional ones. In this way students change from passive consumers to active surfers or doers. Multimedia elements, time and place independence, wide information sources belong to other advantages which cannot be found in classical education.

## **2 Educational portal "eLearn central"**

eLearn central team was inspired by the advantages of eLearning and is creating an alternative source of information and also workplaces for student's individual as well as team projects: the educational portal for students „eLearn central”, to enhance the quality and effectiveness of the traditional teaching methods.

The "eLearn central" portal started in December 2004. It is located on the server of the Department of Microelectronics of the Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava accessible through the following link <http://ec.elf.stuba.sk>. The current version of this portal is using a course management system Moodle 1.94. More than 15 groups of courses, for example "Electronics", "FREE", "Electrotechnics", „Management", "Team projects", "Individual projects", were designed and located on the "eLearn central". More than 150 courses (four basic types of our courses: a library of eLearning source, a standard self contained learning course, one-shot course – a fast course and a project) are still being developed in these groups and more than 1900 users are registered there. Some of the courses are available for all users (in category "FREE"); other courses only for the users who are registered after filling out a simple form. The access to the rest of the courses is allowed to registered users with special additional access rights.

The unique of this portal are origin interactive animations. More than 30 interactive animations have been developed: animations of passive devices, passive filters, diodes and their usage in electronic circuits, as well as BT, HBT, JFET and IGBT transistors, both real and ideal MOS structures, examples of planar technology produced diodes, bipolar junction transistor and CMOS, digital circuits and gates are included. These all interactive animations are accessible in a library of interactive animations: Course "Interactive flash animations" with free access (Interactive 2006).

A novelty of portal "eLearn central" is development of educational modules with appointed topic. These modules have structure as a lesson of the standard self contained eLearning course – educational text in form of SCORM packages, interactive animations, glossary, and number of hypertext references and quizzes.

We use the educational portal "eLearn central" as a standard part of education in form of blended learning, as educational support in distance learning and also as communication support for individual and team projects. The response of our students is very positive, and they use the portal as educational source also after finishing their study course, for example as preparation for their diploma exam. On the other hand

huge surprise for us is that a major group of our new students coming from secondary school have no experience with eLearning. eLearning can be today very effective and a modern form of study, but not used enough at primary and secondary schools.

### **3 Low interest of youth about Mysterious World of Electronic Technologies and Systems**

The importance of progressive micro-/nano-electronic, sensorial and optoelectronic technologies and their applications by using designed methodologies are well known. These applications are used in wide social spectra to improve health and quality of life, living environment, security, traffic, information accessibility, technology process control and decreasing power and price consumption.

Despite the fact that we live in modern time, the interest of students in study electronics at university rapidly decreases. This is the reason, why we need to find out new motivational study methods and implement them in the educational process not only at university but also at secondary and primary schools, which are a source of young scientists of our brighter future.

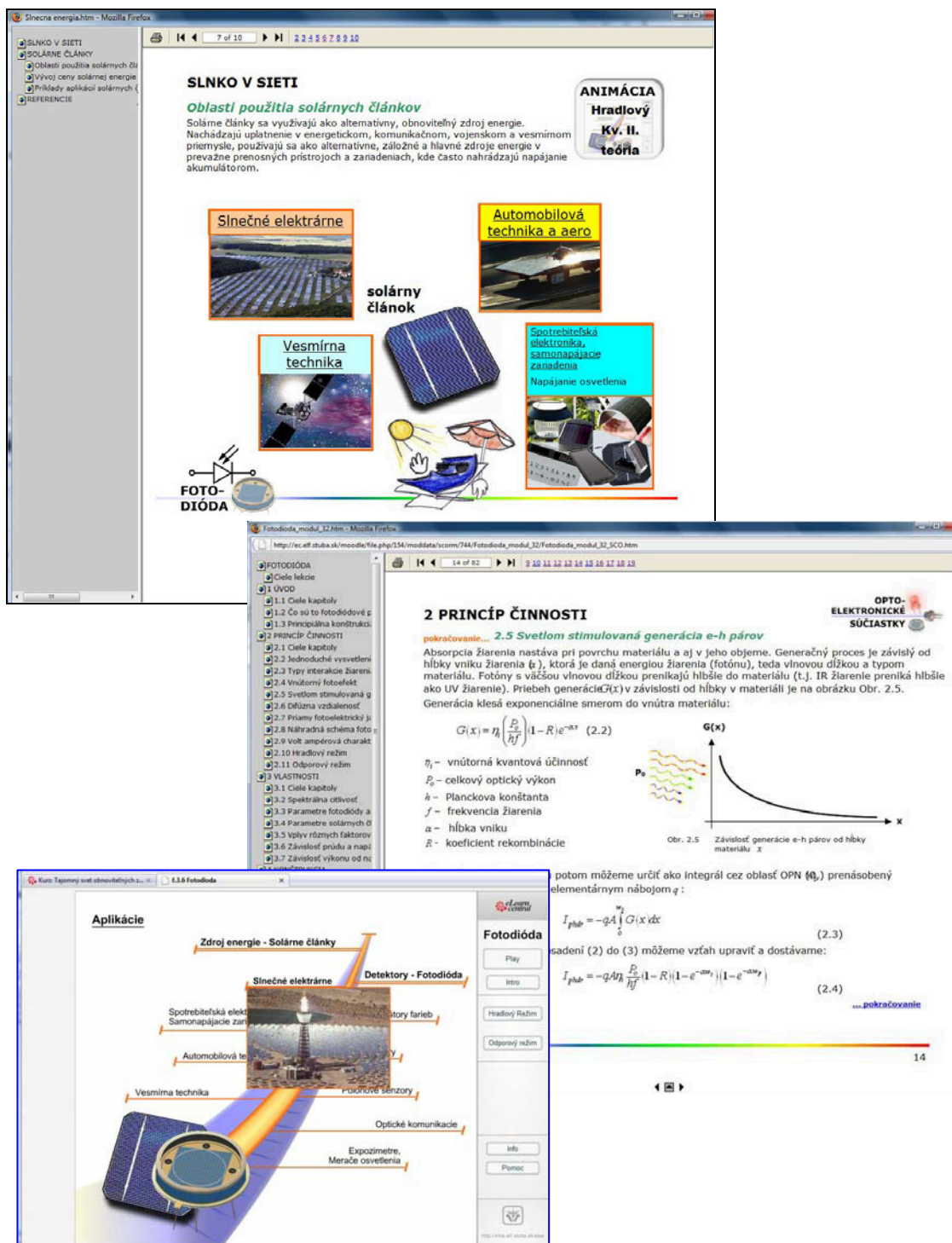
The popularization of research and development results for general public with focus on young generation that is to say popularization of science and technology results and innovation is a solution to the very bad situation in which there is absence of new, highly qualified experts using new progressive present technologies.

Over the last years eLearning is becoming more and more popular way how to beat the students' lack of interest. eLearning is very demonstrative, playful and easy way how to initiate students into the topic. As Wlodkowski states, "Motivation is not only important because it is a necessary causal factor of learning, but because it mediates learning and is a consequence of learning as well" (Smith, 2008).

eLearning is one of the effective tools which contribute to popularization and increase of technology research and development. Its application can lead directly to making the progressive technologies more attractive. We would like to increase interest of youth in technical and natural science oriented disciplines in Slovakia by this way. We want to present the importance of progressive micro-/nano-electronic, sensorial and optoelectronic technologies and their applications by using designed interactive eLearning modules prepared with different level of educational content (uninitiated and university students).

### **4 Educational interactive modules as motivational tools in Science and Technology**

As we mentioned before a novelty of the portal "eLearn central" is developing of educational modules with appointed topic. The educational content of the modules is delivered in a very motivational and demonstrative way to capture students' attention and to awake their interest not only in the optoelectronic devices, but also in the field of optoelectronics itself. This is achieved by the unique structure of the modules as well as various features implemented throughout all of the modules such as attractive pictures or interactive content.



**Fig. 1** Chapter “Segments of solar cell applications” in education and popularization modul “Sun in network”, Chapter “The principle of operation” in education modul for university students “Photodiode”, View of animation “Photodiode” “Application”.

Figures in the modules and in the animations follow common graphical template to form a compact structure and so emphasize that the same topic is addressed. Besides the standard educational text, the modules contain the following elements: course and

chapter objectives, questions and tasks and links to animations. All of the created modules have the same common content structure: Introduction, Principle of operation, Properties, Construction and Applications.

We decided to convert these educational modules to popular – education modules. The new modules will be prepared for secondary school students. The content will be consulted with teachers from secondary schools.

For example from education module “Photodiode” was created “Sun in network” about basic principles and applications of photodiodes as solar cells (Fig. 1).

New modules will be free accessed on educational portal “eLearn central” after final consultation.

## **5 Conclusion**

eLearning is not only a very useful tool to enhance the quality and effectiveness of traditional teaching methods according to our experiences with use of courses and educational materials on portal “eLearn central”, but we believe that eLearning presents huge potential for the popularization of Science and Technology. We focused on youth and area of Electronic Technologies and Systems with aim to increase interest of student to study at technical universities.

We would like to find a solution to the problem, so we are interested in cooperation with teachers from secondary schools in developing new popular-educational modules. These teachers are fully aware of the knowledge and potential of their students.

We have been developing two types of educational modules. The educational modules for university students were created as an innovative study material satisfying the newest knowledge in the modern education methods. Their simple and straightforward structure meets pedagogic fundamentals and reflects experience gathered by eLearn central team members over years. The same advantages give huge potential for creating and developing the popular-education modules – we have converted this study material by popular way with aim to use it as motivation for general public in consideration to increase youth interest in Science and Technology.

All popular-education modules will be free for all interested in.

## **6 Acknowledgement**

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## Curriculum



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