USE OF INTERACTIVE APPLICATIONS IN EDUCATION OF THE ISSUES OF EFFICIENT USE OF ENERGY IN BUILDING

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ABSTRACT

When teaching in schools, especially in vocational subjects, it is very important to attract and motivate students to work independently, not only to remember important facts, but also to develop their ability to seek new solutions independently. One of the active assistants in achieving this goal can be the active use of information technology that is close to the current young person. In addition, it is essential not only to learn new knowledge in education, but also to educate them towards an active approach to environmental protection, the use of renewable energy sources and also the economic use of available resources.

This paper provides an insight into energy efficiency teaching in building construction. Education is realized through an internet application, which aims to motivate students to develop their active approach to education. The new trend in education is based on the student's active approach to action, which fully meets current practical requirements, uses modern information technology and uses very rapid feedback on learning outcomes.

Keywords: environmental education, energy education, internet applications in education, interactive web-based applications

INTRODUCTION

The new development of society in all areas requires the use of new methods and procedures also in schooling, especially in vocational subjects. At the same time as new methods, it is equally necessary and very important to apply new teaching aids to enable the acquisition, retrieval, processing of large amounts of data and the provision of a wide range of information [1].

Students are currently growing under the pressure of constantly evolving digital technologies. Digital technology will play a major role not only in their daily learning life but also in their relaxation [2].

The basic aim of teaching is to acquire all levels of knowledge, remembering, understanding and applying the acquired knowledge and knowledge, as well as acquiring skills in their use in related fields and activities. The great task of educators is to motivate students to work independently, focusing not only on remembering important facts but also on their effective application [1]. One of the active assistants in achieving this goal should be an information reached not only at the right time, but also in some context processed and understood that will help students to develop their social and intellectual capital skills [3] and autonomy in finding new solutions.

In synergy with the education team, it is necessary not only to learn new knowledge, but also to educate towards an active approach to environmental protection, the use of renewable energy sources and also to the economical use of available resources [4].

Therefore, the active role of students in the teaching process is important to simultaneously and gradually develop their environmental sensitivity and abilities, which, when completed, enable them to apply their design experience, for example, in parallel with their vocational training for the design of energy-efficient buildings [5].

USE OF INTERACTIVE INTERNET APPLICATIONS IN EDUCATION

The above requirements for graduates are based on a specification of needs that should be put on interactive web or mobile applications that are deployed in study programs and used subsequently throughout the teaching process.

From the above requirements for technical university graduates, setting up the parameters and custom specification of their needs is based on the deployment of a customized web-based learning portal as one of the ways students actively work in the learning process and a creative, independent approach to problem solving. Young generation categorized as digital natives [6] can no longer imagine mutual communication without digital technology.

In order to achieve higher quality education, used mobile [7] or interactive internet applications [8] are used to motivate students to develop their active approach to education [9]. The interactive application was designed as one of the educational innovations for the purpose of improving the education process at the Technical University [10]. This solution has grown into the creation of an internet-based education portal, which aims to increase students' motivation to develop their active approach to studying the principles of photovoltaics.

By its application, however, we have achieved a significant increase in quality and efficiency in the area of creating other applications to detect photovoltaic potential. The aim of creating an interactive application [11] is to motivate students to develop their active approach to photovoltaic education in Slovakia, the application must be easily accessible to students and must not be difficult to control.

The use of energy in building construction in the context of current European Union legislation for the design of energy efficient buildings requires the use of renewable energy sources [12]. This is, for example, energy from the sun. Solar energy can be used advantageously through a photovoltaic system.

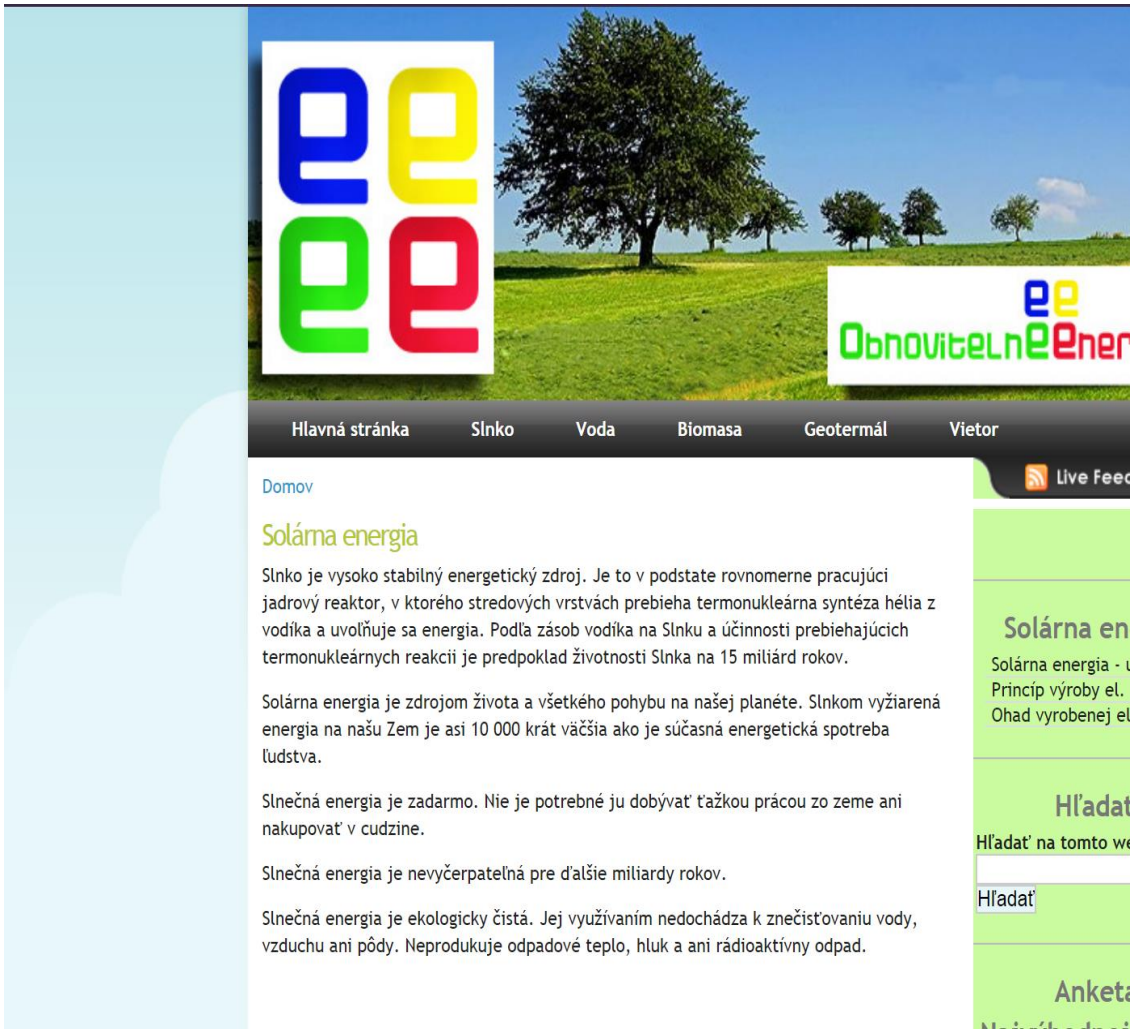

Figure 1 Internet education portal

The main objective of energy efficiency teaching in the building sector is to create an energy model of existing buildings and to highlight the possibilities of using renewable energy sources based on the knowledge gained.

Based on the measurement of the basic energy inputs, it is possible to create an energy model of the building, which will then be used to model the various uses of energy facilities to improve the energy balance of buildings. Some options for creating energy system models are listed in [12].

The energy model of a building can be obtained in several ways. One of them is the creation of a model based on the measurement of energy consumption and the acquisition of additional energy from human or outdoor activities, for example through a photovoltaic system. The next step will be to determine the photovoltaic potential at the appropriate geographic location. Through the use of interactive applications, students can actively verify the performance of a photovoltaic system on a web portal. At the same time, the web portal also serves a further function by providing students with online access to study materials using data from the Photovoltaic Geographical Information System (PVGIS) because the current generation of young people prefer

visual interactive activities performed through digital media in a graphical way through various multimedia or interactive mobile applications.

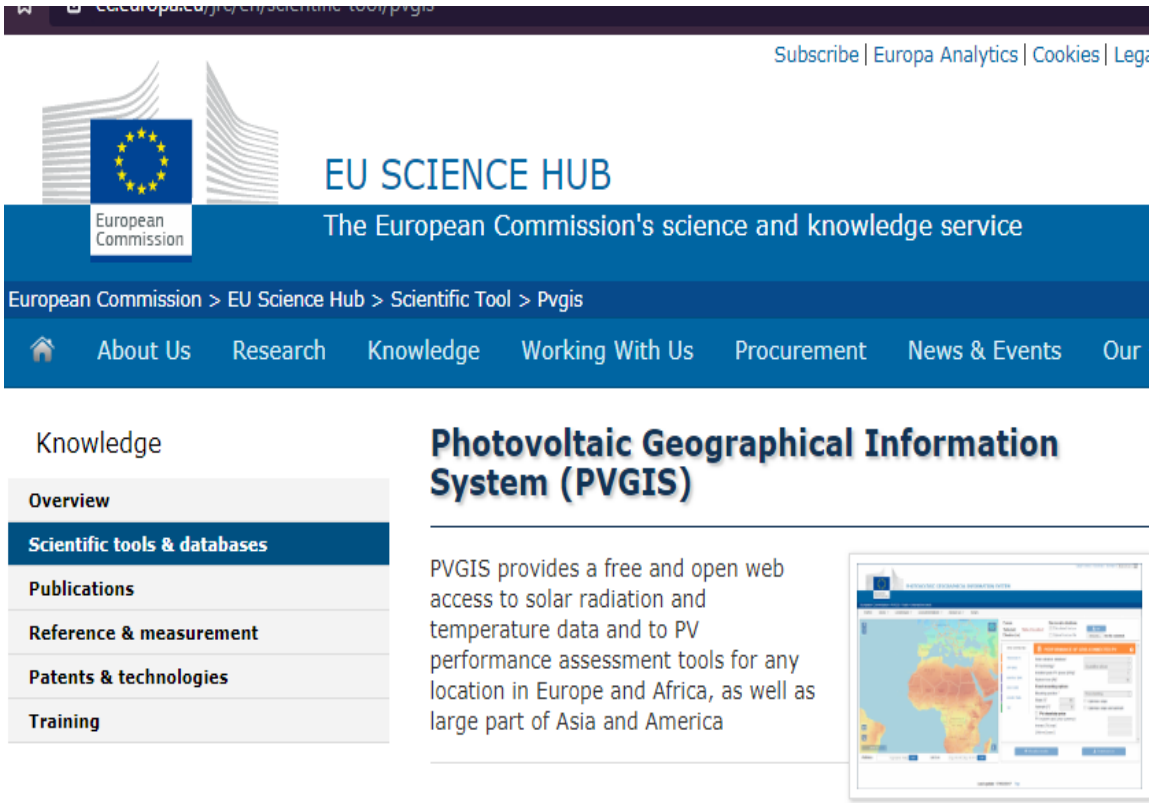

Figure 2 Photovoltaic Geographical Information System (PVGIS)

The Photovoltaic Geographical Information System searches for data based on the coordinates of the building or area in which we want to determine the photovoltaic potential. To provide this information, we used PVGIS data in conjunction with the Application Programming interface to integrate the map from Google Maps. To link our application, we used the cURL library in combination with the PHP programming language, which is interpreted on the server.

The result of our work is our own internet portal solution, which, after filling in a few data, informs the user of the amount of energy produced in order to continue building on the energy model of the building and, based on the lessons learned, to highlight the possibilities of using renewable energy in the area of energy efficiency.

As students prefer a digital form of problem solving, it was necessary to give them the opportunity to easily find out the knowledge of the teaching process, so that their environmental feelings and abilities as well as their energy-efficient buildings were developed in parallel with their training.

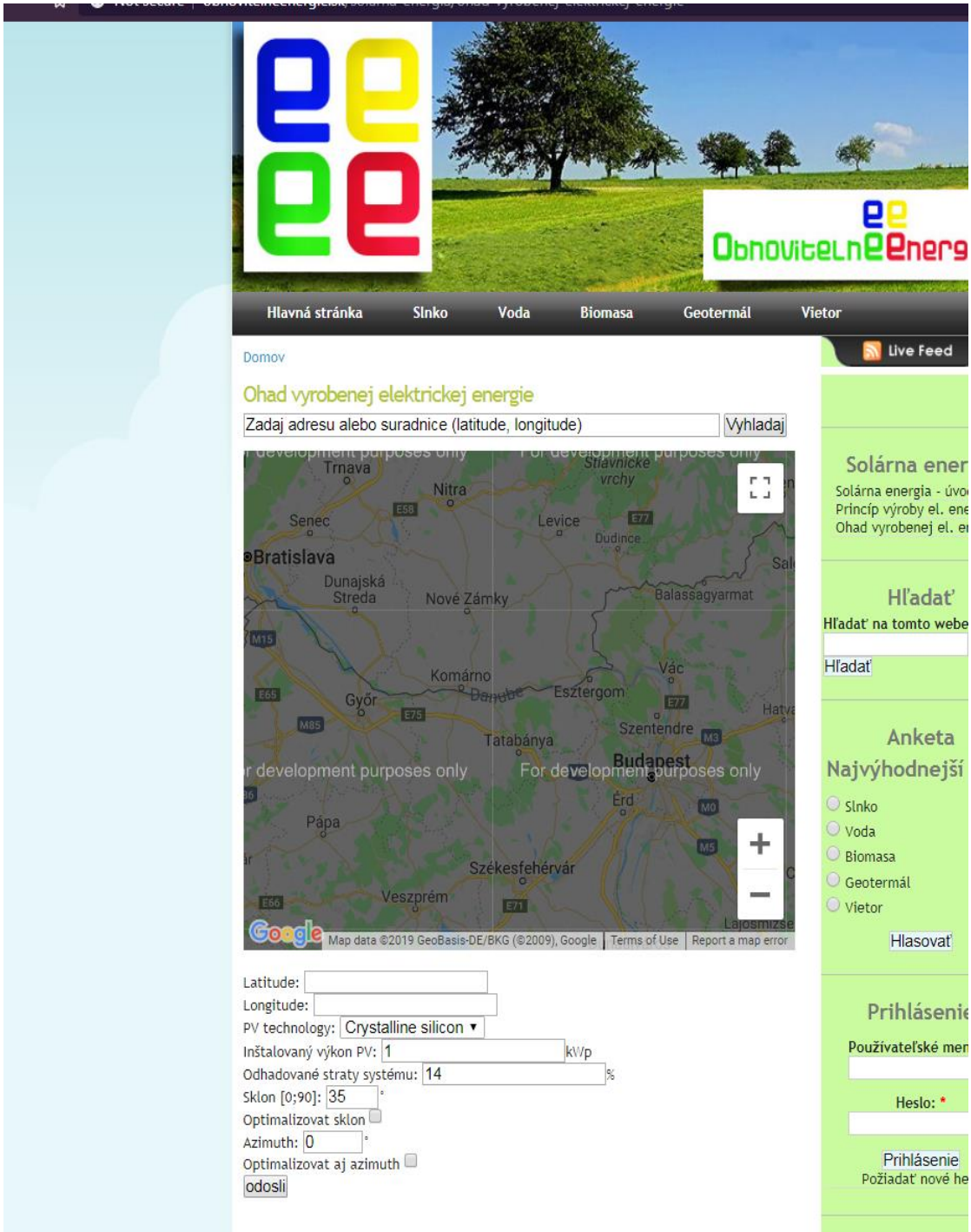

Figure 3 Form for Estimated Power Generation

The interactive internet application has been designed as one of the educational innovations with the emphasis on using natural digital literacy and playfulness as the core features of our students. We thus supported the natural desire of our students for the amusing discovery of new knowledge they prefer over passive learning.

CONCLUSION

The current demands of the labor market require experts in the latest technology in the field. It is very important in professional subjects to apply the procedures associated with the use of digital applications in the teaching process.

In a broader context, this is a need for interdisciplinary education for students in different fields not only in technology and science, but also in environmental protection, the use of renewable energy sources and the economic use of available resources.

Environmental education should not only be a way to share and disseminate information, or through tests by a knowledge control tool. An interactive web portal should be one of the key tools of digital communication in the teaching process and the creation of digitized teaching materials.

The basic contribution of the contribution, but mainly the creation of the educational portal, is to increase the motivation of students to work independently on the basis of solving real practical tasks with the support of information technologies. Creating a learning portal is a tool for activating student work. By comparing the learning outcomes with the previous period, it is possible to see an improvement not only in the achieved average, but also in a reduction in the difference between the results of individual students. The use of information technology gives students a tool they understand and want to use. The use of the information education portal will enable the expansion of the learning space and increase the integration of education. School-student cooperation can also be an element of motivation and cooperation.

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