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LiveUSB Mediated Education (LUME)

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ABSTRACT

In this article the authors propose LiveUSB Mediated Education (LUME) as a term to describe the packaging of a complete set of course material together with the software necessary to access the material on a portable memory device. It is argued that the method offers a convenient tool to utilize Open Educational Resources (OER) and can significantly improve the availability of education worldwide. The article gives a description of the design and implementation of a course within the project USo+I: Universidad, Sociedad e Innovación financed by the European Union, within the ALFA III program. The course uses only OER and all material is available from USB-memory sticks to meet any problems of limited access to computers or internet.

Key words: *e-learning, Learning Management systems, engineering education, developing countries*

BACKGROUND/CONTEXT

In the spring of 2009 Thomas Edison State College in the United States began to offer course packages on USB flash memories under the name "flash track courses" (Mearian, 2009). The idea to create and distribute a complete package of courses that can run on any computer is not new, before the advent of USB flash drives with sufficient capacity at reasonable prices removable hard drives could be used by teachers in a similar way (Hailey & Hailey, 2002).

If computer-assisted courses shall be available to people in the third world the courses must be based on course materials and software that are free for educational purposes. Such resources are called Open Educational Resources (OER) (OER-Commons, 2007). There are vast amounts of free material available online. If you have access to the Internet you can use material from thousands of university courses from the world's foremost educational institutions.

OER is still not an everyday tool for teachers. In developing countries limited access to computers and the Internet has to be considered, but a major obstacle for a wider use of OER is the low awareness about the available resources (D'Antoni, 2009).

The authors propose the term LiveUSB Mediated Education (LUME) for a complete course package including all course material and all the software needed in the course. By proposing the term LUME the authors wish to bring together existing technical and pedagogical methods to a coherent concept. We do not claim to have invented any of these methods.

PROJECT

The method of mediating education with USB memories was utilized when the University of Boras was asked to give a course about Learning Management Systems (LMS) to Latin American engineering educators. It was a part of the EU-funded project USo+I, *Universidad, Sociedad e Innovación. Mejora de la pertinencia de la educación en las Ingeniería Latinoamérica* (University and Society: Improving the relevance of engineering education in Latin America).

The course was to be given first in Cuba in March 2010 to lecturers at the Instituto Superior Politécnico José Antonio Echeverría, Facultad de Ingeniería Eléctrica, Havana, and then at Centro Universitario de Occidente – Universidad de San Carlos. CUNOC-USAC, Quetzaltenango, Guatemala.

When the course was planned an intriguing question was how to teach about computer enhanced education without internet access, and how to work effectively with limited access to computers. Since the participants in this course would be expected to act as pioneers at their respective workplaces and promote the use of ICT in education it was also highly desirable to use pedagogical methods that the participants would be able to apply in their work and bring their attention to the abundance of resources, freely available on the internet.

These issues led to the decision to use OER and gather all course material and software on a USB drive. Course materials were then copied into a 4 Gb USB-stick and was supplied to each participant. The programs Moodle, Sumatra PDF, VLC mediaplayer, LyX, HotPotatoes 6, AbiWord, MoWeS, II and Portable Open Office was saved together with more than 50 Spanish-language videos with practical guides, downloaded from YouTube. Moodle (Modular Object-Oriented Dynamic Learning Environment) (moodle.org 2010) is an open access learning management system used by many institutions worldwide. There is much material on how to use it, freely available on the Internet. Since all computers that would be used during the course had some version of Windows installed, applications that work with Windows were selected and no operating system was supplied.

The course was planned as problem-based learning (PBL). With all the material collected on a USB memory stick, the participants had the task of taking a course they teach and adapt their material to the learning management system Moodle, so that the course would be flexible (i.e. could given as a distance course). The participants should plan the use of different tools in Moodle, shared documents, bulletin board, forum, management of assignments, etc. Thanks to the method LUME each participant was able work when it suited them and they could access a computer, save their work, and save their settings of the programs they used between sessions.

The course was given in two parts, an introduction with the participants gathered on campus for two weeks followed by approximately three months of distance education, in total corresponding to 15 ECTS points or ten weeks of full time studies. All instructional material and software at both these occasions were the same and the same assignments were given to the participants. When the course is completed the participants are free to copy and re-use the course package in their work, they may in fact teach the entire course themselves.

RESEARCH/EVALUATION METHOD

By the end of the two weeks introduction an anonymously filled out questionnaire was used as a part of the course evaluation process. The group on Cuba also answered a questionnaire about LMS and one about OER. In Guatemala a single questionnaire with statements about LMS and OER was used.

OBSERVATIONS AND RESULTS

The results from the course evaluations, questionnaires and discussions clearly indicated a high level of appreciation from the participants. Most of the participants intended to use a wide range

of tools in the available LMS in the near future and expressed an interest in using OER and make their material available as OER (Garrote Jurado et al., 2010a: Garrote Jurado et al.2010b).
The advantages with LUME became obvious during the course, particularly the flexibility for the participants. It was also clear that they had not been aware of the abundance of resources available for education in the form of OER, nor had they thought about the possibility of using USB sticks to utilize OER.

DISCUSSION

The described method offers considerable flexibility. A student can connect an USB stick to any computer, anytime, anywhere, then study the course material and work with assignments and exercises. Between sessions all work is saved on the USB-stick.

The described method can facilitate education, in particular in developing countries, by offering teachers and students a convenient tool to utilize OER.

An appropriate label on a method is important to enable dissemination of information about the method. Therefore the authors suggest the term LUME to be used for a complete course package with course material and software needed a course. It will then be easier to introduce the concept to teachers and educational institutions.

The term “Live” as in LiveUSB commonly refers to memory devices containing an operating system (OS) that operates independently of the OS that is installed on the computer. When it refers to a complete course package, we suggest that the term LUME is used even if no operating system is included (or if it is attached in some other way, such as on CD-ROM), the important thing is that all software required to access the course material can run without being installed on the computer. Obviously it is possible to imagine other technical solutions to replace the USB memory, for example many modern mobile phones have a Secure Digital memory (SD) that can be used in computers or mobile phones.

SUMMATION

The term LiveUSB Mediated Education (LUME) stands for a complete course package with all course material and all software needed in the course stored on, and executable from a memory.

The method LUME offers a lot of flexibility and may be used to support traditional education in the rich world. But, more important is that the method offers a convenient tool to utilize Open Educational Resources (OER). That way it can significantly improve the availability of education worldwide. When LUME is used together with OER we may actually come close to universally available education within the foreseeable future.

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