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INCREASING USE OF VIRTUAL LEARNING ENVIRONMENT IN HIGHER EDUCATION

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Abstract

Internet technologies are having a tremendous impact on learning industry. Organizations, institutions and higher education have developed and are using web based courses but little is known about their effectiveness compared to traditional teaching. . In the last 10 years, higher education has benefited from a real revolution-most universities now have a functioning Virtual Learning Environment at the heart of their teaching and e-learning programmes.

1. Introduction

As higher education continues to move away from traditional lecture-based programming and to more hands-on scenarios, university classrooms will start to resemble real-world work and social environments that facilitate organic interactions and cross-disciplinary problem solving. A student-centred approach to education has taken root, prompting many higher education professionals to rethink how learning spaces should be configured.

This paper focuses on the effectiveness of a web-based virtual learning environment (VLE) in the context of basic information technology skills training. This article provides two main contributions. First, it introduces and defines the concept of VLE, showing how it differs from the traditional classroom. Secondly, it presents a framework of VLE effectiveness which is bound to the pedagogical context of use. Finally, it focuses on the innovation brought by VLE designed to support the following: the distribution of multimedia material (such as readings, lecture notes, assignments and images), student-teacher group discussions, promoting of collaborative learning, etc.

1. What is a VLE (Virtual Learning Environment)?

A VLE or learning platform is an online system that allow teachers to share educational materials with their students via the web. Examples include: Moodle, web CT or Blackboard. Being able to access a virtual room as either a duplicate or extension of their physical classroom is a clear advantage for learners and teachers alike. A VLE doesn't refer to any educational web site and

it is not restricted to systems including some 3D/ virtual reality technology. Between these over-general and over specific definitions, there is a range of environments which vary along the criteria mentioned below. This paper aims at providing an understanding of the specificity of environments which deserve the “virtual learning environment” label. For instance, „virtual learning environment” is not synonymous to a „virtual campus” which provides University courses while the first one does not restrict the scope to any age or level. Moreover, there are some features of virtual learning environment:

- *Communication*- opens up an infinite number of channels in the formats of forums, discussions threads, polls, surveys and offer instant feedback either as a group or individually.
- *Producing work*- students do not physically have to find their teacher to hand in work due to secure virtual „hand-in” folder. VLE is a social space where educational interactions occur in the environment so that spaces are turned into places.
- *Resource hub*- teachers have infinite online storage space for ppts, dcs, worksheets that can be either be secure or shared with students; students are not only active, but also actors; they c-construct the virtual space.
- *Dynamic home pages*-teachers have the opportunity to create an exciting virtual space to represent their room/subject.
- *Links to outside sources*- pathways to all other online learning spaces as the dynamic feed of the homepage.
- *Podcasts & Videos*-both teacher and student can enrich classroom activities by producing podcasts and videos.
- *VLE are not restricted to distance education*-many web based courses combine distance and presence, which makes learning environments more robust.
- *Virtual learning environments integrate heterogeneous technologies and multiple pedagogical approaches*- a physical learning environment generally integrates courses, resources (libraries), formal communication (boards), etc. Similarly a virtual learning environment integrates a variety of tools supporting multiple functions: information, communication, collaboration learning and management.¹
- *Most virtual environments overlap with physical environments*- virtual learning environments do not integrate all the physical tools that be found in a classroom.

¹ Peraya&Al., 1999

In practice, however, there is no need to draw a boundary between physical and virtual worlds, the key is to integrate them, not to separate them. The continuity between physical and virtual objects becomes clear now that hybrid tools² appear that connect computers with physical artefacts:

- boards on which students move blocks whose positions are known by the computer (as in chess games)³. These are physical objects but coupled with a representation in the virtual space can be used for interactions which are not possible in the physical world.
- single-display group ware systems; several students interact live in front of the same screen but with a different mouse. While their actions are performed in the virtual space, most of their interactions occur in the physical world; the students not only talk to each other, but touch even push each other.
- *The virtual space is explicitly represented-* the representation of the learning environment ranges from text-based interfaces to the most complex graphical output. The key is not the representation per se, but what students actually do with this representation. For instance, we observed that virtual space imparts on users behaviour even when space is only described by text.⁴ Nevertheless, representations are not neutral; they do influence the student work. Representations of the space may have an impact on the learning process beyond motivational aspects. Here are some examples:
 - virtual space may support navigation. This is of course not the case for any spatial organisation (e.g. not for a labyrinth). „City of News”⁵ is an example of information space organised as a city, designed for exploiting people’s ability to remember the surrounding three-dimensional layout.
 - Let us imagine a virtual museum. If the virtual space aims to imitate physical rooms, the student would explore it, room by room. In a museum, the information space is structured by „painting schools” (e.g. surrealism) or centuries, or countries. Instead, the information space could be organized differently. Imagine an „Europe 20th century painters map” (2D, 3D or more complex). Students would explore this virtual museum in a way that is different from real museums.
 - Let us imagine a drill practice environment in which 100 exercises are distributed over 10 virtual rooms. On the graphical representation of this course, students can see who else is in the same room (Gutwin&Greenberg,

² See the European Programme „the Disappearing Computer”.

³ <http://kn.cilt.org/csc199/A40/A40.HTM>.

⁴ Dillenbourg&al. 1999, p98.

⁵ <http://ali.www.media.mit.edu/~flavia/CityOfNews.html> .

1998)⁶. Thereby, if Paul is in rooms 5, facing difficulties with exercise 5.3 and sees Suzanne in the same room, he talks more with her than with Sandra who is in room 3 and does not know anything about exercise 5.3. Reasoning on „who is where in virtual space” tells „ who is (and has been) doing what”. Generally speaking, a awareness tools inform users about what others are doing in the workspace and are important for facilitating collaborative tasks.

- *A VLE is a designed information space*- any web site is a built information space. For learning environments, the functional requirements are numerous and have not been yet systematically studied. Here are a few examples:
 - using information in educational interactions. For answering simple questions such as: „Give me an example of...” or „ Give me an argument against...” information must be stored in databases or other information structures that can be used to produce dynamic responses.
 - Multi-authoring. The information stored in a virtual learning environment is produced by many authors: several teachers, students, domain experts. There must be mechanisms for sharing objects(e.g.: „locking” an object when somebody is editing it) and workflow techniques (e.g. the document produced by X must be sent for approval to Y and Z before to be displayed).
 - Indicating information source. Web information without explicit information regarding to (the authority of) its author will soon have no more value.

According to Dillenbourg⁷ „today’s use of virtual learning environment is not restricted to well-structured information space, but we expect that this criterion will become more salient, as content management becomes a main issue for all teachers involved in virtual learning environments”.

2. Effectiveness

VLE –s are by definition open systems that allows for participant interaction through synchronous or asynchronous electronic communication. Early research suggests that interaction through electronic media in VLE-s is most

⁶ The effects of workplace awareness of the usability of real-time distributed groupware, Research report, 1998-632-22, p. 23.

⁷ P. Dillenbourg, D. Schneider, Paraveski Synteta „Virtual Learning Environment” 3rd Hellenic Conference „Information&Communication, Technologies in Education” 2002, Rhodes, Greece, p.45.

appropriate in support of learning rather than as the primary delivery medium (Vaverek and Saunders, 1993⁸).

In the context of VLE-s, participant interaction and electronic communication can play an important role in fostering effective learning by enabling students to evaluate their progress and instructional needs: thus complementing the high degree of learner control. When given the ability to ask and answer questions, to post comments, and to generally engage in an intellectual exchange with peers and the instructor, students verbalize their current understanding of the material. Participants in a VLE not only post their questions and comments but also monitor contributions by others and can in turn reply. Virtual space designers do not necessarily try to imitate physical space, they look for creating new affordances. In the same spirit, the most relevant mode of communication is not necessarily the one that imitates face to face conversations. The comparison is not the key issue (Shlaget et al, 1999⁹) showed that, online real-time meetings followed similar patterns as face-to-face meetings. There are some situations for which no medium has been found as effective as physical co-presence. For instance, launching a project and negotiating goals is very hard to do by e-mail. Therefore, empirical studies on computer-mediated communication are often expressed in terms of „What is loss” for instance, moving from face-to-face to chat students, lose facial expressions, body gesture, voice intonation, etc.

For instance, MUD¹⁰ messages are only sent when emitter hits the ENTER key. This is different from usual conversations and hence disturbs beginners. Often, the emitter repeats his question before the receiver has the time to answer. However, experienced users have developed ways to cope with this: before typing a long answer, they inform the partner by a short sentence such as „Let me answer”. Another trick is to type only the beginning of the answer, followed by the symbol [...] to indicate that the message will continue (implicitly asking to keep the floor). The metacommunicative acts become part of a specific culture of virtual environments. Our challenge is to understand these opportunities and integrate them where they are pedagogically relevant.

The specificity of virtual learning environments is that beyond direct text/voice/video messages users may communicate in other ways: exchanging objects, moving in the space. Many virtual environments

⁸ Computer-speak: Message Content and Perceived Appropriateness in an Educational Setting, *Journal of Educational Technology Systems* (22:2), 1993, p/23-139.

⁹ Evolution of an On-Line Education Community of Practice, p.123-129.

¹⁰ MUD is a text-based virtual space, multi-used supporting synchronous and asynchronous communication.

include a shared space, i.e an interface where users see the same collection of objects, can add objects, take them in their private space, edit them, delete them, etc.

Whiteboards¹¹ are typical examples of shared spaces. Because these objects are persistent, they support referencing in verbal communication. Writing activities (producing syntheses, study reports, newspaper) are very popular among students. They are not restricted to consuming Web information; they become information producers, they enter into the game. Often the writing activity is per se an educational goal, but in many cases it is just the end point of a variety of earlier activities such as: site visits, observations, experiments, interviews, etc. A physical learning environment generally integrates courses, resources, libraries, formal communication (boards) and informal communication (cafeteria), etc. Similarly, a virtual learning environment integrates a variety of tools supporting multiple functions: information, communication, collaboration, learning, collaborative learning, etc. VLE contain obvious affordances for collaborative learning. The issue is how virtual learning environments increase the probability that productive interactions emerge. Designers create environments which structure collaboration namely interfaces which structure the task (specifies the different phases, who has to put which object at which phase) or the communication. The latter are called „semi-structured communication interfaces” (Jermann&Schneider, 1997)¹². These are communication tools in which the users communicate through a predefined set of widgets (a widget can be a button such as „I agree/ I disagree with you”, or a sentence opener such as „What do you think about”, and the user has to complete it). The very idea of environment includes this notion of integration. This is clear in virtual campuses. Because of their broad scope, they have to fulfil administrative functions: managing, who is registered to which courses, collecting assessment, notes to count credits and also functions such as assistance, leisure & fun, etc. Virtual learning environments do not only imply a variety of software tools but also integrate all the physical tools that can be found in a classroom. Most virtual learning environments include:

¹¹ Type of software in which two or more users draw on the same page a set of objects can see what the other does, edit and delete objects drawn by partners, etc.

¹² Jermann, P. & Schneider, D.K. (1997) Semi-structured interface in collaborative problem-solving. Swiss workshop on collaborative and distributed systems. Lausanne, May 1st 1997.

- A variety of non-computerised learning resources; concrete manipulation tools, instruments, books, etc.
- A variety of interactions that are non-computer mediated: face to face discussions among students, lectures by the teacher, group discussions, plus traditional media such as letters or e-mail.
- A variety of activities that are non-computer based such as: field trips, role-playing

3. Conclusion

The growth and widespread acceptance of the Internet has seen the creation of the VLE in higher education. For the ease of integration of VLE-s in higher education, software companies have provided products such as WebCt and Blackboard. From a pedagogical perspective new technologies must be evaluated in an effort to establish whether their introduction has had a beneficial impact on learning outcomes. A VLE can also create incentives to invest further in electronic content, create links to other Information and Communication technologies (ICT-s) applications within the university, such as wireless networks and services, and generally enable institutional innovations in learning and education. This paper defines VLE as a range of systems that comprise feature like social space being a „place” where participants are active and present actors. It argues that using VLE does not guarantee effectiveness per se. It must be integrated with rich pedagogical scenarios which must profit from its various facilitating features.

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