VIRTUAL LEARNING ENVIRONMENT

MILOŠ MILAŠINOVIĆ
University of Novi Sad, Faculty of Technical Sciences, milos.milasinovic@openlinkgroup.com

JELISAVETA ALEKSIĆ
University of Belgrade, School of Electrical and Computer Engineering of Applied Sciences, jelisaveta.aleksic@openlinkgroup.com

MILOŠ JOVANOVIĆ
OpenLink Group, milos.jovanovic@openlinkgroup.com

IGOR FRANC
Metropolitan University, Faculty of Information Technologies, igor.franc@openlinkgroup.com

NIKOLA ALEKSIĆ
University of Belgrade, Faculty of Organizational Sciences, nikola.aleksic@openlinkgroup.com

Abstract: *Virtual learning environments (VLEs) are rapidly becoming an integral part of the teaching and learning process. They enable improvements in the efficiency of communication, both between students and teachers and among students.VLEs provide support and enhance the individual learning process by offering courses storages, forums, chats as well as mass communication opportunities. Educators need to understand that learning is a social process and that more than electronic lectures and e-mail discussions are required to provide an exquisite learning environment. The quality of course design, the use of appropriate tools, and the context of the course are key factors influencing success in the era of mass higher education and lifelong learning. Furthermore, the success of a virtual learning environment depends marginally on student acceptance and the use of such an e-learning system as well as students' innovations and computers.*

Keywords: *E-learning, Virtual learning environments, Education, Information technology*

1. INTRODUCTION

Virtual learning environments (VLEs) are swiftly converting into an essential component of the schooling and learning processes. They facilitate advances in the performance of interaction, both between learners and instructors and among students VLEs provide support and enhance the individual learning process by offering courses storages, forums, chats as well as mass communication opportunities. Educators need to understand that learning is a social process and that more than electronic lectures and e-mail discussions are required to provide an exquisite learning environment. The effectiveness of program layout, the application of proper devices, and the context of the program are essential determinants affecting success in the age of mass higher education and permanent education. Moreover, the realization of a VLE basically depends on student recognition and the utilization of that particular system as well as students' innovativeness and computer interests. There is a growing global initiative to practice the technologies based on the Internet as a method of inscribing various difficulties that higher education faces. An advanced feature of this method has the appearance of systems and approaches devised to make the design of studying more "distributed". Distributed studying is identified as studying held in the undefined place or time, but which incorporates the exercises of the on-campus learning system as well as those of the "distanced learners".

Due to the simple accessibility of the Internet, there has been a notable alteration in the education and schooling processes (Beller & Or 1998; Kiser 1999). Scholars are fundamental members of any educational environment. The essential point that distinguishes between VLEs and the conventional learning environment is the application of technology and a transfer of charge and responsibility to the students. Six dimensions are used to assess the factors, including student dimension, instructor dimension, course dimension, technology dimension, design dimension, and environmental dimension.

Focused on these methods, a effective VLE can be conferred as an place in which students:

1. are able and challenged to construct their knowledge (learning as knowledge building);
2. are all challenged to be active agents who are interdependent (community of learners);
3. perceive and experience the virtual learning environment as supportive of their collaborative learning (computer-supported collaborative learning). [1]

Though both conventional academic and virtual learning methods have prominently concentrated in the preceding decade, they nevertheless ought to be altered. Larson (2002) describes conventional educational learning as

presenter-centered preparation of synchronized and cataloged crowds, restrained by classroom vacancy, while online studying is participant-centered, asynchronous, and accessible when and wherever. Likewise, Sauer (2001) defines virtual learning as adapting to accelerated obsolescence and demanding just-in-time education of ephemeral experience flexible to a particular venue, as opposed to more enduring and durable educational methods. Additional illustration by Smith (2001) identifies the unconscious intercommunication of the conventional classroom from the widespread of pre-preparation needed by distance-learning forms. Kerka (1996) recognizes the benefits and drawbacks of online education, compiling that virtual learning can be both utterly interactive and concurrently lonely due to the intrinsic challenges of strengthening cohesiveness and honest connectivity among student [1] [12].

2. BACKGROUND

A virtual learning environment combines real and virtual worlds to provide users with a sense of presence in the virtual environment. Such environments have emerged in teacher training programs as both effective and efficient approaches (Straub, Dieker, Hughes & Hynes, 2014) designed to support the management and operation of most aspects of an online course: the distribution of multimedia material (such as readings, lecture notes, assignments, and images); student-teacher and group discussions; exam and grade administration; and other teaching and administrative tasks.[2]
VLEs could be recognized by the next characteristics explained separately through this benefaction.

A VLE is manufactured space of information

We refer to the “architecture” of information instead of “structure” or “organization” of information to emphasize the fact that the structure results from analyzing the functional requirements of the environment. For education spaces, the practical conditions are diverse and still have not been thoroughly defined. Researchers must produce a more solid knowledge of the practical connection between how data is structured and expressed and how it can be applied in studying exercises and cooperations.

A VLE is a convivial space

An educational interactions occur in the environment, turning spaces into places. A set of Internet pages does not establish a VLE unless there is cultural cooperation regarding the knowledge. Cooperation can take numerous structures, including simultaneous (like chats) or asynchronous (electronic mail, panels) communication, singular or plural, text-based or audio and video, or even obscure interaction such as distributed objects. Students find themselves included in this space of information and observe their representational model and/or the model of the rest of the participants within the space. As soon as students see who else is interested in which information, the space becomes inherently social.

The virtual space is precisely presented

Educative communications transpire inside the setting, contributing to the spaces-to-places transformation. The key issue is not the representation per se, but what the students do with this representation. For instance, we observed that virtual space imparts on users' behavior even when space is only described by the text. (Dillenbourg & al., 1999). Notwithstanding, designs of the space may become an impression on the education process beyond motivational perspectives.

Students are considered as creators, not only as active participants

Students tend to co-construct the virtual space. In Internet-based environments, learning activities range from multiple-choice questionnaires to simulations and problem-solving. Simulations are described as self-sustainable studying settings. What is more specific to VLEs is the collection of exercises within which participants create and distribute articles. Frequently these articles are websites. In other words, the idea of the education activity in VLEs refers to something more affluent than in individual courses, closer to the concept of the project. The distinction among other settings and what virtual environments potentially advance can be defined as presenting students not only as 'active' but also as actors or members, contributing to the cultural and learning space.

VLEs are not limited to distance education

They also enrich classroom activities. Web-based education is often associated with distance education, while - in the practice- it is also widely used to support presential learning. The distinction between distance learning and presential one is dissolving.

VLEs incorporate varied technologies and several pedagogical methods

Comparable to a physical learning environment, a VLA combines a variety of devices bearing various functions: data, interaction, collaboration, studying, and supervision (Peraya & al., 1999). The very idea of the environment includes this notion of integration.

Most virtual environments overlap with physical environments

VLEs do not only include a widespread of software programs but also incorporate various physical tools that ought be distinguished in a classical teaching facilities.

3. RESEARCH

It is essential to settle on what was advanced within the individual learner. The process is concerned not just with the acquisition of subject-specific knowledge and skills, but with the development of more general, or strategic, approaches and skills. The author has argued previously that this development must also take place in the context of the acquisition of discipline or professional culture if both sets of knowledge and skills are to be of value to the individual in and applied by them too, new scenarios and fields of study and employment. This belief drives to an advent to program configuration which is output-driven and concentrates on the educational methods and the

influence it derives on the student, preferably than an input-oriented aspect which converges on a form of content and its reception by the students:

- Identify learning outcomes - Whet is the course's goal? In which way was course altering the participants? Learning consequences should make transparent to students the direction of where they are heading at the end of the curriculum. They make the meaning for acquiring obvious as all the learning exercises and tests that make up the lecture should be in connection to the defined results
- Design Learning Opportunities - What can a learner do which will demonstrate that one or more Learning Outcomes have been met? Whatever the learners' current skill and specific knowledge are, these actions should be practical or "unique". Any learning opportunity (something learners are asked to do as part of their learning) is potentially a formative or summative assessment and should be related to the Learning Outcomes of the course.
- Utilize Deconstruction - Suitable to the students' capabilities, higher-level junctures can be pre-deconstructed toward lower-level opportunities for the student.
- Consider Group or Individual Learning - Learning opportunities/assessments can be examined for the nature and appropriateness of their collaborative/group working potential.
- Identify or Create Resources - one way of categorizing resources is as theory (subject-specific, information), external resources (e.g. reading lists, Internet resources, and lectures) and references (particular procedural suggestions or variety of guidances) and internal resources (other studying opportunities which are constructs of a deconstruction of the certain opportunity, or which highlights obligatory learning requirements). [3]

On the other hand, while research documents a positive connection between teacher's subject matter knowledge and their performance in the classroom, it has also been established that teachers with advanced preparation (in addition to typical coursework and fieldwork experiences) in teaching methods and strategies have a greater chance of successful longevity in the classroom [4]. When instructors are equipped in both content and teaching, it creates an immense contrast not simply to their quality of the course but also whether they're expected to begin and linger to his schooling (Darling-Hammond, 1999). A virtual reality learning environment allows for combined learning in content knowledge, teaching pedagogy, and problem-solving strategies [5].

To assist the VLE system evaluation this paper uses an integrated multiple criteria decision-making approach that combines the analytic hierarchy process (AHP) and quality function deployment (QFD).

4. RESULTS

Virtual learning by no means can be a replacement for classroom learning. But it can be used effectively to enhance the learning process. Virtual or online learning provides various channels such as mail, online chat and video conferences, through which students and instructors can interact with each other. Classes are not as interactive as they are live. Communication via email cannot replace direct communication. There can always be misunderstandings. The primary value attributed was its ease of use in posting and distributing documents, assignments, and announcements to students. An important secondary use was for communication, such as emailing students [2]. Amongst the numerous advantages mentioned by researchers, a great reason for the increase in virtual learning has been due to its capability to transform the limits of time and place. Students have the benefit of retrieving learning materials at their convenience in terms of when, where, which content, and how much [7]. Virtual learning provides students with more time to get familiar with the materials and focus their thinking (King, 2002). This makes discussions more succinct and focused, with opportunities to collaborate and easily share information [8] [9]. Students tend to be poorly interested in learning materials and courses in class. However, the students' interest was piqued after the implementation of the model. Students are used to seeking the solution to a problem on their own. Likewise, students were obligated to explore solutions on their own and, therefore, capable to remember what they studied for a longer time. There are several sorts of exercises that stimulate students' training. The Internet presents scholars with the chance to communicate with the instructor and other classmates. Moreover, it conquers constraints connected with the place and time. The conceptual framework for the development of problem-based learning via a virtual learning environment model is illustrated in Image 1.

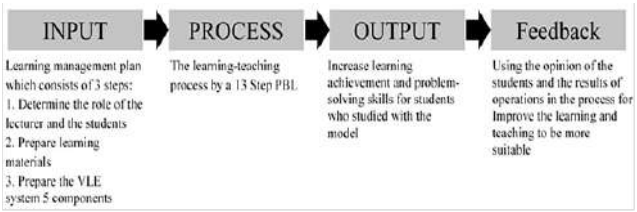

Image 1: Virtual learning environment model

Defining the purpose of learners and teachers

The perception of learners; and teacher's positions in the class are necessary for advancing the effectiveness of the model. The part of the learner is the most important and influences how education is done. Students have the responsibility of determining what and how they want to study regarding the concept of self-study. This suggests learners have to maintain their own account efficiently and be interested in each step of the training method. There are several studies on self-control supporting the importance of a well-structured problem-solving process [10]. The part of a teacher in the design is to build and operate instructional programs and supplies in extension to preparing programs for learners to be available for the class. Lecturers promote and encourage learners to convince them to investigate practicing their full strength.

Preparing for a VLE System

A virtual environment in online learning is established for teachers and scholars to communicate online as if it were a classical classroom. Students cooperate along with themselves and lecturers through social media. There are five elements of the VLE:

- *The studying management systems* - (SMS) produced for the study supported manage all learner data, including their profiles, activity flow records, logging statements, and progress reports.
- *The content system* - included instructional records and tools used to create content and explanations for a set of actions. Teacher demonstrations were conducted through the use of a streaming platform such as YouTube Live Streaming.
- *The cooperation system* - enabled learners to cooperate within an asynchronous medium, specifically an online chat room (Hrastinski, 2008)
- *Resources* - added to the website including curriculum content produced by teachers and students.
- *The evaluation system* - concentrated on the students' portfolio, which was a set of completed tasks, papers, duties, and exercises listed and distributed both in the form of publications and Internet content [12].

5. CONCLUSION

In conclusion, we have argued that the use of Virtual Learning Environments is an important and strategic means to facilitate education initiatives. VLEs are one of the most promising methods of delivering safe, cost-effective, convenient and flexible learning environments to supplement traditional teaching and offer an effective means of enhancing the student learning experience. The implementation of technologies in higher education requires a long process of planning where many different people are involved. This paper explains that virtual learning technologies, though equivalent to the “live” course form, are not affiliated with distinguished depravity of information alteration and do grant additional cost and admittance capabilities in analogous learning conditions. Moreover, given the rather meaningful associations between the sense of community variables and success and accomplishment obtained here, any development in the perspicacity of cohesiveness and assignment and cultural cooperation would be exacted to develop the acumen of education, fulfillment, and program resolution. Consequently, methods such as “social conferences”, intercommunication on general job-related matters, and timed competitions to determine and state difficulties all could raise the discernment of community and fundamental satisfaction and achievement. This paper observes that self-proclaimed studying consequences of these studies are in patter with those of stated results for “live” seminars. This is significant because it suggests that a minimal corporate investment in virtual learning activities, compared with “live” activities, can make an important contribution to employee satisfaction and success and employee self-worth measured by the receipt of an internationally recognized certification. [12] The results showed that problem-based learning via a virtual learning environment enhanced learning ability and problem-solving skills among students. Learner feedback regarding the design was assertive, as it accompanied their engagements and applied problem-solving to incite studying [11]. VLEs offer popular learning environments because of their convenience and flexibility, but their effectiveness remains an open question. Findings suggest that students learning basic IT skills in VLEs have better learning effectiveness than their counterparts in traditional classrooms. The effect of adopting new technology may be transitory in nature and not an enduring outcome. This finding indicates that the performance is not because of the transitory effects of novelty. Thus, it is reasonable to suggest that learning in the virtual environment is beneficial from a performance point of view. Most learners were satisfied with the high technical quality and reliability provided by our virtual learning environment. As a result of systems availability, students may have more chance to verbalize and articulate their current understanding [12]. VLEs can be used for supporting communication, study groups, and learning communities invaluable new ways that can complement traditional media and methods, rather than replace them [2]. The notable benefit of the unified strategy is that the evaluating standards are of importance to the stakeholders. It guarantees that the chosen system will fulfill the necessities and meet the stakeholders' expectations. Another benefit is that the approach can assure constant benchmarking and reliability. Therefore, the universities should continue to run the system to support and facilitate both teaching and learning [6].

REFERENCES

[1] Ligorio, Maria Beatrice, and Klaas Van Veen. "Constructing a successful cross-national virtual learning environment in primary and secondary education." *AACE Journal* 14.2 (2006): 103-128.4.

[2] Dutton, William H., Pauline Hope Cheong, and Namkee Park. "The Social Shaping of a Virtual Learning Environment: The Case of a University-Wide Course Management System." *Electronic Journal of e-learning* 2.1 (2004): 69-80.

[3] Stiles, M. J. "Effective learning and the virtual learning environment." Proceedings: EUNIS 2000–Towards Virtual Universities, Instytut Informatyki Politechniki Poznanskiej. 2000.

[4] Ingersoll, Richard, Lisa Merrill, and Henry May. "Retaining teachers: How preparation matters." *Educational Leadership* 69.8 (2012): 30.

[5] Peterson-Ahmad, Maria B., Jane Pemberton, and Katrina A. Hovey. "Virtual learning environments for teacher preparation." *Kappa Delta Pi Record* 54.4 (2018): 165-169.

[6] Ho, William, et al. "Measuring performance of virtual learning environment system in higher education." *Quality Assurance in Education* (2009).

[7] Liaw, Shu-Sheng. "Investigating students’ perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system." *Computers & education* 51.2 (2008): 864-873.

[8] Thah, Soon Seng. "Leveraging virtual learning environment to scale up quality teaching and learning in Malaysia." *Asia-Pacific Collaborative education Journal* 10.1 (2014): 1-17.

[9] Liaw, Shu-Sheng, and Hsiu-Mei Huang. "Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments." *Computers & Education* 60.1 (2013): 14-24.

[10] Choi, Ikseon, and Kyunghwa Lee. "A case-based learning environment design for real-world classroom management problem solving." *TechTrends* 52.3 (2008): 26-31.

[11] Phungsuk, Rojana, Chantana Viriyavejakul, and Thanin Ratanaolarn. "Development of a problem-based learning model via a virtual learning environment." *Kasetsart Journal of Social Sciences* 38.3 (2017): 297-306.

[12] Chou, Shih-Wei, and Chien-Hung Liu. "Learning effectiveness in a Web-based virtual learning environment: a learner control perspective." *Journal of computer assisted learning* 21.1 (2005): 65-76.