Some Issues of E-pedagogy:
A Case Study at University of Education (VNU-UED)

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Abstract: In 2010 the first e-learning courses had been held to train teachers (Bachelor level) and the educational managers (Master degree) at the University of Education, Vietnam National University, Hanoi (VNU-UED). The application of the non-traditional mode in this teaching approach has created a number of changes in deploying the pedagogial activities and learning environment. These courses were designed in the direction of supplying the contents of knowledge and organizing the teaching activities in the new way in order to raise the output quality and develop the professional skills for the learners at UED.

This research was conducted to make recommendations in the pedagogical aspect on how to get access to the design and organization of e-learning, to make clear a number of fundamental principles and to explain the phenomenon of E-pedagogy concept based on the previous classic teaching theories.

Keywords: E-pedagogy, E-learning, learning theories, technological acceptance.

1. Inroduction

Many authors and educators have documented that implementation of Information and Communication Technologies (ICT) in higher education represents challenges and changes in pedagogical paradigm and approaches of new learning format in the 21 century [1].

Actually, with the staging of routinely use interactive technology (virtual rooms, online learning, blended learning etc.) today's instruction and students' activities enhance the best learning scenario. Thus the teacher's action is transformed to the extent that his or her own role encompasses a variety of tasks and functions, showing a consistent dynamic in the assimilation of content knowledge, pedagogical knowledge and technology pedagogical knowledge, innovation and training for a community, circumscribed in a digital condition.

The need to provide more engaged learning experience and outcome is common interest course's designers-instructors today. And many faculty begin their own courses with primarily question: "How to change passive teaching and learning approach toward to students' achieving high-order learning outcomes?". Recognizing the core principles is not obvious because we

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know many online courses provide students and faculty the ability to interact with each other via an digital/electronic learning tools (bulletin board, discussion board, email, forum or synchronous chat areas. The success of these courses frequently depends upon the nature of this interaction. It is not unusual for instructors to encourage, and in some cases require a certain. Garrison D.R, Vaughan N.D (2008) argue that the time has come to reject the dualistic thinking of choosing conventional face-to-face and online learning that is no longer tenable, theoretical or practically.

The motivation for this research is to find out some theoretical basic that links the principles and methods of instructional delivery courses (pedagogy) at the core of e-learning courses design process. By making e-learning instructional design more pedagogically grounded in terms of learning effectiveness, outcomes and experiences, any efforts and implementation in e-learning development (curriculum design, learning activities and interactivity, content delivery, assessment etc.) will be focused from usability and flexibility to teaching.

Thus, pedagogical paradigm and approaches of new learning format may be explored in context of recognition of the importance of "interactive and engaged learning experience growing by ICT to connect learners" or "reshaping and enhancing the traditional classroom more acceptable and effective" [2].

1.1. Aims and objectives

The aim of this research was to establish argument of change in teaching practice by looking at examples of different pedagogic principles employed in cases of e-learning process in teacher education. The proponent of

change also reflects that learning format and pedagogy should be developed to face new challenges of technology implication in teaching today, i.e. "e-pedagogy".

The objectives of this research are:

- To examine some aspect of phenomena "e-pedagogy";

- To analyze students' acceptance of new learning format and technology;

- To evaluate changes of pedagogies correlated with learning activities and environment by implementing learning technology in e-learning process.

1.2. Research questions

If "e-pedagogy" should be developed to reflect new learning challenges and reality today, and if e-learning ever increasingly employed in teaching practice, there are three questions need to be asked:

- How is "e-pedagogy" built and developed from classical learning theories?

- What is relationship between "e-pedagogy" perspective and students' acceptance and engagement in e-learning courses?

- How "e-pedagogy" principles and techniques need to be realized in e-learning (if students accepted e-learning courses)?

2. Research methodology

- *Pilot e-learning courses*: The methodology used for this study was a descriptive analysis of learning activities and performance data collected in a undergraduate and graduate programs at UED. Learning Management System (LMS) Moodle have been offered for these two programs since 2011.

Table 1. Two courses in LMS Moodle at UED

Pilot courses	Degree	Name of courses		Specialization
Course 1	Bachelor	Teaching-learning theory, methodology and technology		Teacher Education
			(2 credits)	
	In-service training (*certificate*)	Teaching-learning theory, methodology and technology		Teacher Science Education
			(2 credits)	
Course 2	Master	ICT use in school management		Educational Management and Leadership
			(3 credits)	

- *Data collection and analysis*: Survey questionnaires on actual student participation and learning activities in e-learning courses were collected throughout the semesters. They have been asked to complete a survey of reason e-learning course acceptance at the end of the courses. The questionnaire is addressed their overall experiences, especially related to their learning reason and pedagogical aspects with the technology used.

- A *methodological perspective theory* was used to guide, organize and group information which aims to build concepts emerging from the data. Sources such as master degree theses (in teaching-learning methodology, educational and instructional management and leadership), essays, articles, book chapters, papers and research reports concerning to online learning aspects.

3. Research findings

3.1. The lack of understanding of e-learning design courses structure and principles

Learning defined as complicate process of inquiry goes beyond accessing or even assimilating information. The individual may have the freedom to find, explore ideas, question, reflection and construct meaning of learning based on learner's need and style,

motivation and interest. J.Dewey (1959) stated that "the educational process has two sides - one psychological and one sociological; and that neither can be subordinated to the other or neglected without evil result following" [1].

Analyzing LMS Moodle of VNU-UED shows the problem with designing such complex systems is that the current design methodology focuses on usability, rather than learning. The learning can be synchronous - where the learner has to be "online" at a particular time, or asynchronous - it can be done at any time, anywhere; self-paced interactive learning using web portals or CD-ROMs and integrating support via online bulletin boards, chat rooms, e-mail or instant messaging. It can also come in the form of knowledge databases, where users click through information that is retrieved from a database and is only mildly interactive [1].

The development of e-learning courses requires a different approach to those employed by the developers of the majority of interactive online and screen-based applications. E-learning is not simple addition or compensation of face-to-face building in another educational layer (format). Similarly LMS Moodle of VNU-UED should not depend simply on delivery of content knowledge, but should provide a satisfying learning experience for the student. "Satisfying learning experience" (Kolb, 1984)

includes observation, reflecting on those observations for constructing new knowledge, being able to create theories based on this new knowledge and putting those theories into practice as well as providing feedback for students' learning achievement and progress.

E-learning courses must be approached with understanding of broad range of the flexible (alternative) design possibilities and challenges of doing learning tasks based on *differentiation*, *individualization* and *personalization* approaches [2]. Current practices in e-learning place the focus of the design process on *usability*. E-learning usability characteristic is the idea that interactive applications should be easy to use and easy to learn, and in order to do this, developers have to take into consideration the psychological, ergonomic, social and organizational factors that determine how people work.

The key assumption of an e-learning design is model "ADULT" [3]: - A: *adaptive*; D: *different/diversity*; U: *ubiquitous*; L: *learning styles*; and T: *transfer*. Thus, e-learning courses, no matter how sophisticated the technology used, should enhance the learning and interaction at the cognitive, behavior and physiological levels [4]. In essence, there is a

lack of focus on pedagogical methodology, of the overall teaching experience in the design of e-learning courses. It is necessary, therefore, to rely on an educational theory to drive the design of e-learning courses. Levy (2005), I. Juke, T. McCain, L.Crocket (2010) stated that the field of e-learning today is marked by a "*juxtaposition*" of new technology and old pedagogy [1], the huge gulf between the learning preferences of digital learners and their non-digital teacher [5].

3.2. The close connection between E-pedagogy and classical learning theories

Traditionally, pedagogy is sometimes seen as a nebulous and complicate concept, it is essentially a combination of knowledge and skills required for effective teaching. The more traditional definitions describe pedagogy as either the science/theory or art/practice of teaching that makes a difference in the intellectual and social development of students.

Its modern usage relates to the teaching and learning theories, i.e. learning as behavior (*behaviourism*), understanding (*cognitivism*), knowledge building (*constructivism*) and engagement (*activism*).
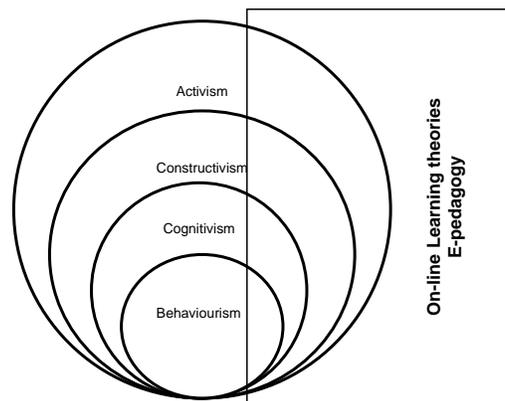

Figure 1. The relations of classical learning theories.

Review of 145 maters theses completed and accepted to UED in the period 2011-2013 and 15 articles and research reports shows little if any definitive evidence of the overall concept of "e-learning pedagogy" compared with more conventional learning theories or pedagogical technology use, methods. This is not to say that this medium is ineffective but rather to say that there is little systematic and empirical work to show evidence of its interest or evaluation. This result may show the need of set of characteristic forms or aspects of pedagogy for e-learning format with existing learning activities nowadays. In this way, the issue of integrating e-pedagogy into the pedagogical system has recently emerged as an important and pressing focus for research.

Table 2. Number and percentage of master theses research topic
(*Adopted by Mishra and Koehler Model, 2006*)

Pedagogical Knowledge PK	Content Knowledge CK	Technological Knowledge TK	Pedagogical Content Knowledge PCK	Technological Pedagogical Content Knowledge TPCK	Technological Pedagogical Knowledge TPK	Technological Content Knowledge TCK	Total %
12	58	4	57	8	2	4	145
8%	40%	3%	39%	6%	1%	3%	100%
Total of 145 master theses on teaching-learning methodology in Maths, Phisics, Biology, Chemistry, Literature and Vietnamese, History and Educational Management from period 2011-2013 at UED.							

In practice the need of "e-pedagogy" - the Pedagogy for Network Learning (pedagogy for online learning, e-learning) or ***Connectivism*** and ***Community of Inquiry*** considers not only the "pedagogical use" of technologies for e-learning. Once again this concept shows a common well-known element for learning in a typical classroom environment: the social and communicative interactions between student and teacher as well as student and student [4].

Connectivism conceptualizes knowledge and learning activities as a *network* consisting of nodes and connections. With usability, from e-learning process new connections between existing nodes-knowledge, nodes-activities and nodes-learner/instructor can be created. And learning therefore is about network of community of inquiry. From educational perspective the community (real or virtual) should be defined and developed with knowledge sharing and social networking/"*net-learning*".

Interaction, connection, presence and performance in e-learning courses can be studied for many reasons including vibrancy of a discussion, students' willingness to share ideas, participation in collaborative activities, and group projects, all of which can support productive learning environments with new technologies [2]. Garrison and Vaughan comment that measuring student success is a "preoccupation" in e-learning especially where learners were *concerned* and *connected* [1].

For example, in LMS Moodle VNU-UED learning community "cross-connectedness" (by tools of Forum, Board Discussion, Chat, Upload file assignment etc.) which has additional meanings in an e-learning context provides interactivity between learners, and between learners and teachers. This potential for interactivity can be used to provide both knowledge-based, task-oriented experiences, and affective social support. This new level of support structure actually offered more learner to learner support than had been provided previously in traditional learning context.

Figure 2. Reporting tools for LMS Moodle at UED.

Figure 3. Example of learner's log activities.

Analyzing pattern and structure of LMS Moodle at UED allows for the design of course modules that are composed of smaller elements, but which are linked in an integrated way. This pattern can show social interactions between students, learning outcomes, collaboration, communication between students and instructor, lifelong learning and life-wide problem solving, simulations, interactive learning materials etc (Figure 3 shows 36455 participants' activities for pilot course of Teaching-learning methodology and technology during 2012 to 2013).

This case of study also shows a number of principles of pattern which ***connectivism*** embraces such as:

- Learning is a network creation and sharing in diversity of opinion, paces in new technology environment

- Learning is a process of connecting specialized points of information resources and personal interests in collaborative work toward common task oriented

- Learning is vital decision making process and may activate by non-human application (technology tools); and

- Capacity to know is more important than what is actual currently known.

On the other hand, LMS Moodle VNU-UED with new technology based on Web 2.0

and cloud computing provides many changes for both teacher and learner (user) in term of learning. It may have encouragement for changes of:

- Individual (personal) production and generated different content (including pedagogical knowledge, content knowledge, technological knowledge, pedagogical content knowledge, technological pedagogical content knowledge, and technological content knowledge), which traditional learning does not work [6]. See also the result of TAM (Technology Acceptance Model) analysis for LMS Moodle at UED below.

- New architecture of participation toward common task oriented (course learner-participants take easy to contribute, comment and edit learning content with instructor facilitation): learners shift from *follower* and *consumer* to *producer* and *creator* [2].

- "Empowerment of the crowd": learners-participants connect with each other to share experience, learning skill and create "learning intelligence community", "community of *inquiry*" and encourage group decision making

- Learning network effects: learning shifts to productive and proactive competition with equal learning opportunity for everyone. Learning achievement becomes common success and reputation of group not individual.

Analyzing online learning activities in Moodle VNU-UED we have collected 17 strategies and pedagogic behaviours emerged from learners-learners and learners-instructors interactions. These specific learning activities in online environment could be divided into different categories such as use of knowledge, information processing, input/output, collaborative, disposition and monitoring, storage and retrieval etc. which closely related to behaviourism, cognitivism, constructivism, activism.

Thus, the *connectivism* can make combined of advantages of different LT, technological effects

and social changes to emergence of a new kind of teacher and learner as well as new learning environment (skilled use of tools, authentic teaching and learning, construction rather than instruction, task/not process oriented, just in time learning, where and how to find answer is more important than what to know etc.).

3.3. The acceptance of new learning format created by LMS Moodle VNU-UED

Model of Technology Acceptance (TAM)

As a part of ICT revolution the use of e-learning rapidly is increasing. The changing learning environment with technology facilitates new kind of learning and roles of both teacher and learner. The critics of traditional LT or approaches to teaching and learning make two arguments: they are not working in new context; or/and they misunderstand the nature of the technological change nowadays.

The LMS based on open sources Moodle at UED takes content and organizes it around courses, modules, and study sessions supported by interactive assessment tools and discussion. Since 2011 for the pilot courses "*Teaching-learning theory, methodology and technology*" (2 credits, for bachelor's degree and certificate) and "*ICT use in school management*" (3 credits, for master degree) all learning activities and materials in the courses are organized and managed by the system and within the system. The LMS provides systems for recording students' activities, self-assessments, assignments and feedbacks. The learner centered interfaces allow teachers to manage workflows and it contains tools for personalized, interactive and collaborative learning. Other features embedded in the LMS are discussion forum, course backup, download, and upload facilities, learner access tracking, course glossary building tool and grade reporting tool.
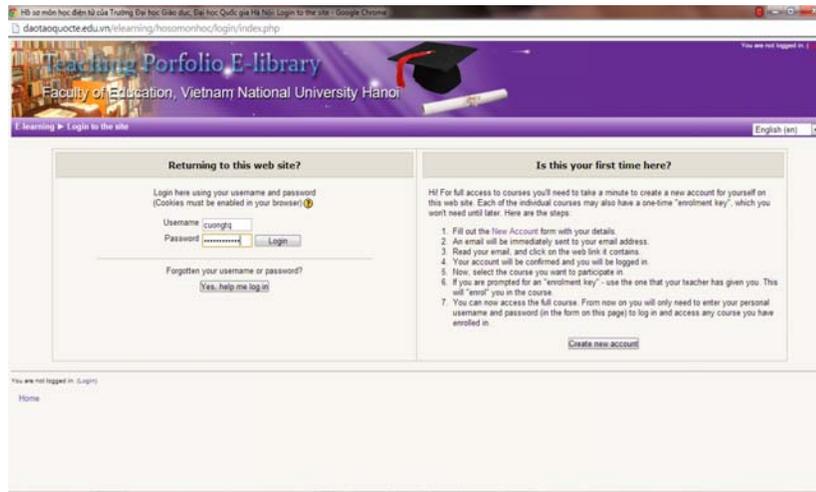
Figure 4. The interface of LMS Moodle UED.
(http://daotaoquocte.edu.vn/elearning/hosomonhoc/)

Several models have been developed in the past three decades to investigate variables that influence individuals' technology acceptance. The technology acceptance model (TAM) proposed by Davis (1989) is the classical information systems model developed to explain computer-usage behaviour and factors associated with acceptance of technology [7].

Application of the TAM model would seem to be favourably indicated for understanding conceptual issues related to e-learning facilitation of use. The use of the TAM is predicated on individuals having control over whether or not they use the system. The main factors in the model are:

- Perceived usefulness (PU),

- Perceived ease of use (PEOU), and

- Attitudes towards usage (ASU).

Beside technological aspect representing attributes or characteristics of the system, such as the overall design and features of the system, the user's skills and capabilities, and the user's beliefs and attitude towards the system [7]. This model also proposes some pedagogical arguments. According to this theory, information system usage behaviour is predominately explained by behavioural intention that is formed as a result of conscious decision-making processes (that works in learning context). Behavioural intention, in turn, is determined by two belief factors, namely, perceived usefulness (PU) and perceived ease of use (PEOU).
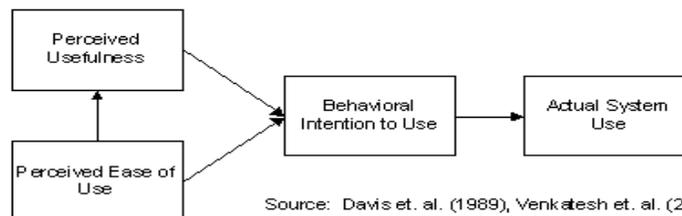

Figure 5. Initial TAM Model (by Davis, Vankatesh).

The setting

A total of 200 participants (N=200) of which 135 undergraduate students, 30 graduate students, 30 in-service training participants and 05 teachers-instructors enrolled in two courses (Course 1: *Teaching-learning theory, methodology and technology* (TMT); Course 2: *ICT use in school management*) for both Bachelor and Master degrees program at UED constituted a sufficient pool of available subjects, who fit well within the context and purpose of this study.

Used research TAM model at UED consisted of 17 items that measured "perceived usefulness" (5 items), "perceived ease-of-use" (5 items), "actual system use" (3 items) and "behavioural intention to use e-learning courses" (4 items). The response scale for all items was a five-point coded as: 5: Strongly agree; 4: Agree; 3: No opinion; 2: Disagree; 1: Strongly disagree.

The hypotheses

According to the research objective and consistent with the related literature, this study tested the following hypotheses:
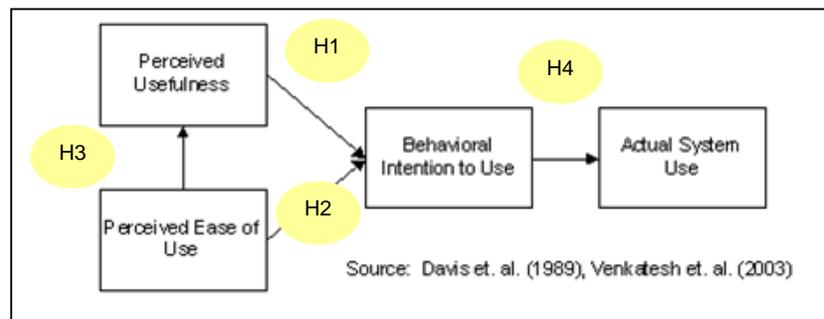
Source: Davis et. al. (1989), Venkatesh et. al. (2003)

- H1: Perceived Usefulness (PU) will have a significant influence on attitude towards Behavioral Intention to Use (BIU).

- H2: Perceived Ease of Use (PEOU) will have a significant influence on attitude towards Behavioral Intention to Use (BIU).

- H3: Perceived Ease of use (PEOU) will have a significant influence on Perceived Usefulness (PU).

- H4: Behavioral Intention to Use (BIU) will have a significant influence on users' Actual System Use (ASU) the e-learning courses.

PUs are relating to terms of: 1. Content: rich media content, usefulness of content: subject knowledge, pedagogical knowledge, technology knowledge; 2. Teacher role: Admin, Instructor, Facilitator, Designer, Co-participant, Assessor; 3. Student role: Self-

Instructor, Facilitator, Designer, Peer-Participant, Peer-Assessor, Researcher; 4. Access: Just-in time; 5. Content delivery: Just-in time; 6. Learning environment: competitive, collaborative, interactive; 7. Learning activities: diversity, differentiation, individual, based on learning style, group work, assessment and evaluation (self-co-peer), Project, higher-order thinking skills.

BIUs are relating to terms of motivation, participation, curiousness, self-confidence, safety, connection between participants.

PEOUs are relating to terms of content structure, rich media content design, content delivery, Web access, technical support, interactivity, usability/flexibility, number of learning tools.

ASUs are relating to terms of total number of students' and teachers' activities, total

number of access to Moodle courses, diversity of logs' activities.

4. Results and analysis

The process of analysis followed the intent of the study. First, validity of model use in the context of the LMS Moodle VNU-UED inquiry was analyzed. Having established validity and robust construct relationships, researchers' data results were then analysed. This is followed by testing of the hypotheses by assessing the model fit using various fit indices and evaluating the research model.

Table 3 shows the average variance extracted (AVE) for each factor and indicates that the questions for each factor correlated with each other but were below threshold for inter-correlating with other factors. Thus, the results indicate that $\alpha > 0.6$ and items of PU, PEOU, BIU and ASU variables guarantee the high reliability (Nunnally, J. C. & Bernstein, I. H. 1994).

Table 3. Cronbach alpha reliability coefficient.

Factor	Items	Alpha
Perceived usefulness (PU)	5	.864
Perceived ease of use (PEOU)	5	.877
Behavioral Intention to Use (BIU)	4	.857
Actual System Use (ASU) the e-learning courses	3	.811

Table 4. Hypotheses testing result.

Hypotheses	Path	Path coefficient	*p-value*	Result
H1	PU >> BIU	0.504	0.000	Supported
H2	PEOU >> BIU	0.253	0.000	Supported
H3	PEOU >> PU	0.607	0.000	Supported
H4	BIU >> ASU	0.604	0.000	Supported

The structural model and hypotheses were tested by examining the path coefficients and their significance. The path coefficients are present in Table 4.   Consistent with designed study hypotheses the results are shown as following:

• H1: Perceived Usefulness (PU) will have a significant influence on attitude towards Behavioral Intention to Use (BIU).

PU and BIU have coefficients p-value = 0.000 < 0.05 this confirms the relation between these two variables with Standard Coefficient Beta = .504. Thus, hypothesis H1 is supported by data.

• H2: Perceived Ease of Use (PEOU) will have a significant influence on attitude towards Behavioral Intention to Use (BIU).

PEOU and BIU have coefficients p-value = 0.000 < 0.05 this confirms the relation between these two variables with Standard Coefficient Beta = .253. Thus, hypothesis H2 is supported by data.

• H3: Perceived ease of use (PEOU) will have a significant influence on Perceived Usefulness (PU).

PEOU and PU have coefficients p-value = 0.000 < 0.05 this confirms the relation between these two variables with Standard Coefficient Beta = .607. Thus, hypothesis H3 is supported by data.

• H4: Behavioral Intention to Use (BIU) will have a significant influence on users' Actual System Use (ASU) the e-learning courses.

BIU and ASU have coefficients p-value = 0.000 < 0.05 this confirms the relation between these two variables with Standard Coefficient Beta = .604. Thus, hypothesis H4 is supported by data.

Thus, the TAM model provided a systemic understanding of students' intentions to use an e-learning courses; such an understanding can help educators examine their assumptions about students' perceptions concerning the value and acceptance of a new technology. The next step, consequently, they may have the ideas about how the learning process can be driven in new learning technological environment, i.e. concept of e-pedagogy.

5. Limitation and discussion

There are several limitations of the present study that need to be considered. Firstly, the fact that traditional teaching-learning methods have been applied to new learning environment (online, blended etc.) may have a significant impact on *rethinking* of pedagogy "radically and comprehensively", contrast the way we image students learn and real way they learn in fact. Secondly, this study may not fully capture the complex or periodicity of e-learning usage aspect. Therefore, the results of this study should be viewed as external preliminary evidence to examining the relationship of students' activities in term of use an e-learning courses in LMS Moodle VNU-UED. There is lack of tools to look inside the system toward identify the essential components of teaching-learning process, especially, examine the relationship between teacher and learner.

Future discussion could be included of studies integrating the technologically test how students value, react, adopt and accept e-learning format with a view to examining the

link to *behaviourism*, *cognitivism*, *constructivism*, and *activism* aspects to clarify various levels of technology acceptance and influence.

6. Conclusion and future work

Nowadays educational systems around the world are faced with the challenge of utilizing the Information and Communication Technologies (ICT) to provide their students with the tools and knowledge necessary in the XXI century. In this sense, the implementation of learning management systems such as Moodle and the use of the tools offered by the Web 2.0, as support for their face-to-face sessions or blended learning, has proven to be effective in our case of study at VNU-UED. It was also observed that there is high acceptance by the students regarding the use of these new technological tools, which have generated in them a greater interest and motivation in the performance of their academic activities.

Learning activities in an e-learning environment may make peer and collaborative learning opportunities easier, thus supporting students' cognitive, affective and social interactions. This pedagogically driven approach to e-learning allows researchers-practitioners to make the link between e-pedagogy and different learning theories and systems. It was found that e-pedagogy (or pedagogy for online learning, e-learning) has been determined in an aspect such as *connectivism* or concept *of community of inquiry*.

However, this understanding makes proposed questions for further research "What is exactly pedagogical philosophy and instructional strategy for e-learning?" and How principles of "e-pedagogy" that work in e-learning format?".

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Một số vấn đề về Sư phạm điện tử: Nghiên cứu trường hợp của Trường Đại học Giáo dục, Đại học Quốc gia Hà Nội

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Tóm tắt: Năm 2010 Trường Đại học Giáo dục bắt đầu triển khai hệ thống dạy học điện tử cho chương trình đào tạo giáo viên (bậc cử nhân) và thạc sĩ Quản lí giáo dục. Việc áp dụng phương thức "không truyền thống" trong cách tiếp cận dạy học này đã tạo nên một số thay đổi trong việc triển khai các hoạt động sư phạm và môi trường học tập. Các khóa học được thiết kế hướng tới việc cung cấp nội dung kiến thức và tổ chức hoạt động dạy học theo cách thức mới nhằm nâng cao chất lượng đầu ra và phát triển các kĩ năng nghề nghiệp cho người học tại Trường Đại học Giáo dục.

Nghiên cứu được thực hiện nhằm đưa ra khuyến nghị về mặt sư phạm trong cách tiếp cận thiết kế và tổ chức dạy học điện tử, làm rõ một số nguyên tắc cơ bản lí giải hiện tượng khái niệm "Sư phạm điện tử" dựa trên các học thuyết lí luận dạy học kinh điển trước đây.

Từ khóa: Sư phạm điện tử, dạy học điện tử, học thuyết dạy học, sự chấp nhận công nghệ.