

ASSESSING THE DIGITAL TEACHING-LEARNING MODEL AT HCMUTE - PRESENT AND FUTURE TRENDS 4.0

ĐÁNH GIÁ MÔ HÌNH DẠY HỌC SỐ TẠI TRƯỜNG ĐẠI HỌC SƯ PHẠM KỸ THUẬT TP HCM - HIỆN TẠI VÀ XU HƯỚNG TƯƠNG LAI 4.0

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ABSTRACT

The education trend of 4.0 affects the current digital teaching-learning model in the country and transformation of the model is indispensable. To accomplish the goal, however, we need to identify the responsiveness of existing models so that we can shape the conversion path so as to take advantage of the available digital resources and promote the effectiveness of new features. The paper introduces the EC-DLM toolkit (Evaluation Criteria for Digital teaching-learning models) which is used in evaluating the digital teaching-learning model as well as orienting and developing the future digital teaching-learning at the HCMUTE. Theoretical background and practical experience show that there are many possibilities for implementing unified digital teaching-learning in vocational education on the basis of the available experience of the HCMUTE.

Keywords: learning and teaching factor; digital teaching-learning model; eClass; EC-DLM scale, EC-WLP toolkit.

TÓM TẮT

Xu thế giáo dục 4.0 ảnh hưởng đến mô hình dạy học số hiện nay ở nước ta và việc chuyển đổi mô hình là xu hướng tất yếu. Tuy nhiên, để thực hiện được điều đó, chúng ta cần nhận diện/đánh giá được khả năng đáp ứng của các mô hình hiện tại để từ đó định hình được lộ trình chuyển đổi sao cho tận dụng được tài nguyên số sẵn có và phát huy hiệu quả của các đặc điểm mới. Bài viết giới thiệu bộ công cụ EC-DLM (Evaluation Criteria for Digital Learning Models) dùng để đánh giá mô hình dạy học số cũng như định hướng phát triển dạy học số trong tương lai tại trường ĐH SPKT. Cơ sở lý thuyết và trải nghiệm thực tiễn cho thấy có nhiều khả năng triển khai dạy học số thống nhất trong lĩnh vực giáo dục nghề nghiệp dựa trên các nền tảng - kinh nghiệm sẵn có của trường đại học Sư phạm Kỹ thuật TP HCM.

Từ khóa: nhân tố ảnh hưởng dạy và học, mô hình dạy học số, eClass, thang đo EC-DLM, thang đo EC-WLP.

1. INTRODUCTION

Digital teaching-learning models are developed in the presence of information technology and the Internet, including teaching with computers or online classes/mobile learning (eLearning, mLearning) or blended learning (bLearning) ... or personal learning environment (PLE) with massive open online course (MOOC) in

the context of current digital knowledge society (Siemens 2004, 2006, Downes, 2012). ; Terry Anderson & Jon Dron, 2011) [3] [5] [7]

In our country, research on assessment and development of digital teaching-learning model is not much popular, which is reflected as follows:

- The consecutive seminars of ELATE 2007, 2008, 2009, 2011, 2013 focused on technological factors.

- The AEN eLearning (Asian eLearning Network) Project was developed from 2002 to 2005 then suspended in 2007, and Vietnam eLearning is in its early stages with the deployment of Moodle into colleges and universities in the form of blended learning. Some large educational corporations follow this direction..

- Some authors study the general learning environment (in terms of rules, learners' role ...) in the IT stage which is not really developed and without orientation 4.0.

- Recently, many studies on reversed classes have been applied to enhance the effectiveness of teaching and learning but it is limited to individual cases and has not been thoroughly researched.

This indicates that the study of teaching with ICT or digital teaching environment in Vietnam is still limited, unsystematic, and has not kept up with the current trend of individual teaching on the knowledge connection system.

In addition, the current status of investment in the development of some digital teaching-learning models without assessment basis of its effectiveness costs much money and labor ... but brings back low benefits in both education and economy which will be inherent strengths if it was properly implemented.

As a leading school in the system of technology and education schools, the HCMUTE has applied digital teaching system since 2006 and has made great progress in the past five years with hundreds of digital courses that have been developed. One important difference in the application of digital teaching of HCMUTE is the research and development of the evaluating method of digital teaching-learning models at the Institute of Technology and Education of HCMUTE. The research accompanying the development of the digital teaching-learning

model will influence the adjustment and development of strategies in the next stages.

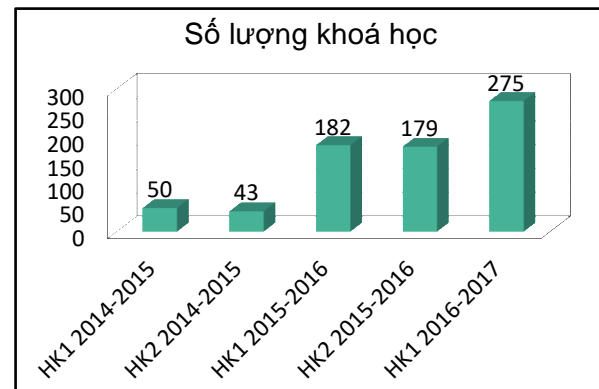


Figure 1. Numbers of courses developed over the years under digital teaching-learning model at HCMUTE

This paper clarifies the important aspects that need to be assessed in the digital teaching-learning model in order to promote the effectiveness of digital teaching at the HCMUTE.

2. DEVELOPING A TOOLKIT FOR ASSESSING THE EFFECTIVENESS OF DIGITAL TEACHING-LEARNING MODEL (EC-DLM-EVALUATION CRITERIA FOR DIGITAL TEACHING-LEARNING MODELS) AT THE HCMUTE.

2.1 Reference models

In the past few years, the Institute of Technology and Education has consulted previous studies on the development of ICT-enabled classroom environment assessment tools such as CCI_ College Characteristics Index (Pace & Stern, 1958), then CUES _ College and University Environment Scale (Pace 1962, 1967) was designed and improved with LEI _ Learning Environment Inventory (Walberg, 1976) and CES_ Classroom Environment Scale (Moos, 1974) which lead to development of a variety of measurement tools for different learning environments. [1] [4] [6]

For a simple, easy-to-use tool to help teachers measure their classroom environment, Fraser, Fisher and Mc. Robbie developed a questionnaire called "The what

is Happening in This Class?" Or WIHIC. This questionnaire consists of 8 scales and 64 items, each scale includes 8 items; These include: harmony, teacher support, student engagement, research, work orientation, cooperation, and equity.

However, a prominent study on the development of a toolkit for evaluating the effectiveness of the digital teaching-learning model is the EC-WLP (Evaluation Criteria -

Web Learning Platform). It is based on defining aggregate criteria by groups: instruction, technique, platform interface, function operation, etc. This toolkit was built on high level of stability and accuracy (0.977, 0.945, 0.946, 0.926, and 0.924) corresponding to following factors: learning interfaces, teaching resources, teaching strategies and learning tools. [2]

Table 1: *The structure of the EC-WLP assessment toolkit includes 40 indicators*

Assessment Aspects	Assessment Criteria	Indicators (number)
Teaching strategies	• Teaching objectives	1, 2, 8
	• Evaluation	3
	• Support	4
	• Instruction	9
	• Communication	10
	• Other strategies	5, 6, 7
Teaching materials	• Accuracy	11, 12
	• Segment ability	13
	• Suitability	14, 16, 17, 20
	• Learning scope	15
	• Clear topic	18
	• Systematic	19
Learning tools	• System tools	21, 28
	• Support the teaching process	22, 23, 24, 29
	• Link function set	25, 26
	• Usability	27
	• Navigation Design	30
Learning interface	• Letters	31, 32
	• Images	33, 34
	• Animation	35, 36
	• Video	37, 38
	• General interface design	39, 40

(Source: Cheng-Mei Hsu, Yu-Chu Yeh and Jen Yen, 2009)

2.2 Factors influencing the digital teaching-learning model at the HCMUTE

Digital teaching-learning models are used at the HCMC University of Technical Education with a comprehensive meaning that reflects the key aspects of the teaching and learning process in the current digital era of 4.0, which are:

- Inclusion of digital learning perspective is understood from [e] Learning = [enhance] Learning or extension in [e3] -Learning (effective, effective and engaging), with meaning of **technology increases learning efficiency** in combination with [c3] -Learning (Collaborative, contextual, and connected learning) **emphasizing individual learning in the context of knowledge society, lifelong learning** on the basis of connection theory - considered as a subsystem in a unified educational ecosystem across the campus.
- Connecting learning theories to social networks and social media. Learning theories generally try to clarify the learning of the person in order to support the best learning. In the current digital environment, that understanding remains important, but it is necessary to understand the theories, models, and the impact/influence of technology, social networks (social media) and the Internet on studying.
- There are many models inheriting the basis of learning theory consistent with changes regarding education perspective in the current 4.0 era, such as: R.A.T model (Replacement, Amplification, and Transformation Model), SAMR model (Substitution, Augmentation, Modification, Redefinition), TPACK, Digital Blooms, Connectivism, Peeragogy ... which help teachers develop curricula that support students in using technology to research, monitor, comment, create, innovate, solve problems, collaborate, advocate, reform, and think critically.

- The development of technology enriches the forms of digital teaching and learning, such as: computer-assisted teaching, Internet-assisted teaching, online / elearning classes, mlearning or blended learning as reverse classes ... associated with specific systems of LCMS, LMS such as Moodle, BlackBoard, Google Classroom, Edmodo ...
- Factors of culture, habit and the technological capability of teachers, learners and management at the digital teaching environment; in addition, appropriate policies and support are also considered as factors that promote the development of effective digital teaching-learning model

Development of additional EC-DLM toolkit from EC-WLP (for evaluation of digital teaching-learning model at HCMUTE):

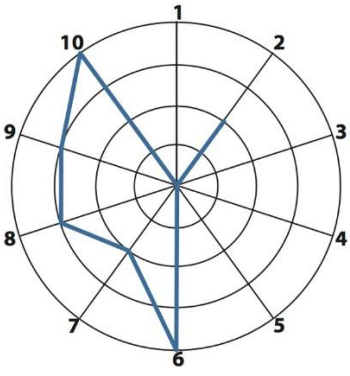
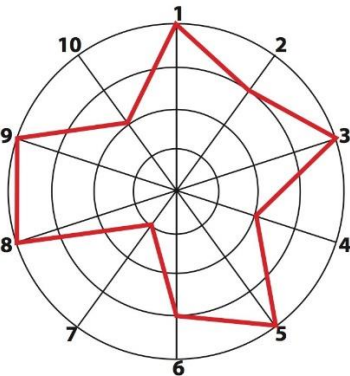
With the EC-WLP assessment toolkit, we adjusted some additional criteria to fit the current educational trends at the HMCUTE which is called EC-DLM with the following criteria:

1. Teaching system
2. Teaching Content
3. Guiding system
4. Multimedia system (Multimedia system)
5. Learning activities
6. Supporting system
7. Interactivity
8. Applicability in mobile applications.
9. Interference
10. Navigation system

3. EVALUATION OF THE DIGITAL LEARNING SYSTEM AT THE HCMUTE (2014-2015) AND THE RESULTS OF THE SECOND REVISED EVALUATION (2016-2017).

With the proposed EC-DLM toolkit, we have conducted an assessment of the effectiveness of the digital teaching-learning model at the HCMUTE as follows:

Table 2: Results of evaluation with EC-DLM toolkit (1st time, 2nd time)

<p>Scope of the evaluation: 350 students in 10 majors of the school year 2014-2015 that were applied digital teaching-learning model engaged in the evaluation</p> <p>+ Evaluation Toolkit: EC-DLM + Result of the 1st evaluation:</p>  <p>Chart of first-time assessment for the status of digital teaching application at HCMUTE</p>	<p>After the first evaluation, the HCMUTE has implemented adjustments and further development of digital teaching-learning models, specifically as follows:</p> <p>Scale of evaluation: 350 students in 10 majors of the school year of 2016-2017 that were applied digital teaching-learning model engaged in the evaluation</p> <p>+ Evaluation Toolkit: EC-DLM +Result of 2nd evaluation:</p>  <p>Chart of second-time assessment for the status of digital teaching application at HCMUTE</p>
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Thus, after a time of applying digital teaching-learning model at the HCMUTE, there have been many fundamental changes based on the evaluation result from the EC-DLM toolkit. The policies of supporting and developing digital teaching of the university are always based on the scientific assessments of the Digital Teaching Center.

Herein, we affirm that the opening feature and ability to update the age-based evaluation criteria of the EC-DLM toolkit has helped the university to orient its development from the result of effectiveness assessment of teaching and learning in today's digital literacy environment.

4. CONCLUSION

This paper presents the digital teaching-learning model at the HCMUTE with the core points and the proposed effectiveness

evaluation of the EC-DLM toolkit from which we can recognize the current problems in developing effective teaching and learning in the industry 4.0.

With the foundation of knowledge and experience in deploying the digital teaching-learning model mentioned above, the HCMUTE has made remarkable progress and is willing to share its available resources – experiences following the development orientation in the future of digital teaching-learning model of vocational education.

In the immediate future, with the purpose of saving time and effort compiling materials for digital learning courses, the General Department of Vocational Training should focus on investing in the HCMUTE to develop and complete digital learning courses for the field of vocational education.

The HCMUTE has adopted a project to share learning resources (LMS and LMCS) in an open manner so that partners and joiners can supplement and enrich the database.

After a period of use at the HCMUTE, the EC-DLM toolkit has proven its ability to

assess and pinpoint the strengths and weaknesses of digital courses. It can be used to evaluate the effectiveness of digital courses offered by the General Department of Vocational Training.

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