Design and develop of constructivist learning environment on learning management system

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Abstract

The purpose of this research is to synthesize theoretical framework and designing framework for Constructivist Learning Environment (CLEs) on Learning Management System (LMS). Research design is developmental research Type I (Design and Development). The procedures were as follows: 1) to examine and analyze the principles and theories, 2) to explore the context of using LMS of learners, and 3) to synthesize the theoretical framework and the designing framework of Constructivist Learning Environment on LMS. The result revealed that: 1) The theoretical framework consists of 3 foundations: (1) Psychological base, (2) Pedagogical base, and (3) Technological base, 2) The designing framework of CLEs on LMS comprises of 5 aspects as follows: (1) The Activation of Cognitive Structure, (2) The Support and Enhancement in Knowledge Construction, (3) The Support for Adjusting Cognitive Conflict, (4) The Support for Extending the Cognitive Structure, and (5) The Support and Enhancement in Appropriate Context, and 3) The Constructivist Learning Environment on Learning Management System comprises of 6 components as following: (1) Problem Base, (2) Related Cases, (3) Information Resources, (4) Cognitive Tools, (5) Conversation and Collaboration Tools, and (6) Social Support.

Keywords: Constructivist Learning environment (CLEs), Learning management system (LMS);

1. Introduction

Progression of science and technology in various aspects of globalization affects social change and economic development of all countries including Thailand. In particular the development of higher education, knowledge construction is necessary since information technology is changing all the time, everyone have to learn for understanding of world social changing. Thus, it’s essential to preparing the learning process to cope with the present situation that is knowledge construction ability. The theories used to serve the above mentioned learning are Constructivist theories. The theory indicates that if the students encounter with the problem that cause them have cognitive conflicts and they should try to adjust their cognitive structure into equilibrium state by integration between prior knowledge and new information until they can understand. That is they can construct the knowledge. (Sumalee Chaijaroen, 2008). This can be supported by David H. Jonassen (1999) who proposed principles for the designing of learning environments (Constructivist Learning Environment: CLEs), which focus on knowledge...
construction. The entity of the knowledge construction results in deep understanding that the learners could create mental representation as mental model. In order to achieve that technology was taken into consideration. Learning management system (LMS), web base attribution and symbol system are utilized as cognitive tools to enhance the knowledge construction and mental model. In addition, these tools may help the learners for communication and interaction in the learning process which providing the learning opportunity anywhere, anytime and anyplace in lifelong learning.

For above mentioned reason, this study intended to synthesize the theoretical and the designing framework of the Constructivist Learning Environment (CLEs) on Learning Management System (LMS). The finding of this study may help the learners to construct the knowledge and create their mental models.

2. The Purpose of Research

1) To synthesize the theoretical framework of Constructivist Learning Environment on Learning Management System.
2) To synthesize the designing framework of Constructivist Learning Environment on Learning Management System.

3. Research Design

Developmental research Type I: Design & Development (Richey and Klein, 2007) was employed in this study: 1) Case Study, 2) Content Analysis, and 3) In-Depth Interview.

4. Research Scope

The scope of this research is to synthesize the framework of Constructivist Learning Environment (CLEs) on Learning Management System (LMS). The theories used are as follows; 1) Cognitive Constructivism based on Jean Piaget, (1965), and 2) Social Constructivism based on Lev Vygotsky, (1925a).3) Constructivist learning environment model (CLEs) based on David H. Jonassen (1999). The designing framework was synthesized.

5. Research Instruments

The instruments used of in this study were 2 kinds as following details:
5.1 The document examination and analysis recording form. The scope of document analysis regarding with Constructivist theories, the Constructivist Learning Environment (CLEs), mental model and learning management system (LMS).
5.2 The expert reviews record form for evaluation of the designing framework. The framework of this instrument consists of 4 major issues which are: learning content, CLEs, the mental model and the learning management system (LMS).

6. Data collecting and analysis

6.1 Synthesis of the theoretical framework of constructivist learning environment on learning management system. The data were collected by analyzing principle, theories, related research and context such as the Constructivist theories (Cognitive constructivist theory and Social constructivist theory), mental model and LMS.

6.2 Synthesis of the designing framework: The above theoretical framework was taken as fundamental to synthesize the designing framework. The underlined theories such as constructivist theories, mental model and
technology, media attribution and symbol system, pedagogy and context were analyzes and transformed into the
designing framework and component of the constructivist learning environment. The relationship between the
underlined theories, pedagogies, technology, media and contexts are illustrated.

7. Research Findings

The result is found that the theoretical framework consisted of 3 crucial bases, and 5 components as following
details:

7.1 Theoretical framework of Constructivist Learning Environment on Learning Management System.

It is found that the theoretical framework of constructivist learning environment on learning management system
consist of 3 crucial bases which compose of: 1) Psychological base: Several learning theories used are Constructivist
theory and Cognitive theory, 2) Pedagogical base: The pedagogies which underlined this framework are CLEs, 3)
Technological base: The technology used in this study is LMS. This study focuses on media attribution and symbol
system. These all of 3 bases were analyzed, and synthesized. The relationship between each of them are shown in
Figure 1.

![Figure 1: Theoretical framework of Constructivist Learning Environment on Learning Management System](image)

7.2 Designing Framework of Constructivist Learning Environment on Learning Management System.

According to this study, the Theoretical framework which was used as foundation in synthesizing the designing
framework of Constructivist Learning Environment on Learning Management System. It is found 5 crucial bases for
Constructivist Learning Environment on Learning Management System which are:

1) The Activation of Cognitive Structure: It is illustrated the relationship between the underlined theories as
follows: constructivist theories and CLEs model. It was designed based on complex problem context (Jonassen,
1999) as the component of Problem base.

2) The Support and Enhancement in Knowledge Construction: It is illustrated the relationship between
underlined theories as follows: constructivist theories, CLEs model (Jonassen, 1999) and Mental model
(Merrienboer, 1997). It was designed as the component of Related Cases.

The components of constructivist learning environment which it’s called Related Cases.
3) The Support for Adjusting Cognitive conflict: It is illustrated the relationship between underlined theories as follows: constructivist theories, CLEs model (Jonassen, 1999) and Mental model (Merrienboer, 1997). It was designed as the component of Information Resource.

4) The Support for Extending the Cognitive Structure: It is illustrated the relationship between underlined theories as follows: constructivist theories and CLEs model (Jonassen, 1999). They were designed as 2 components of Cognitive Tools, Conversation and Collaboration Tools.

5) The Support and Enhancement in appropriate context: It is illustrated the relationship between underlined theories as follows: constructivist theories and CLEs model (Jonassen, 1999). It was designed as the component of Social Support.

The activation of cognitive structure

The designing framework are synthesized based on the above mentioned theoretical framework. The relationship between the underlined theories and the components of the constructivist learning environment are shown in Figure 2.

8. Summarization


Figure 2: The designing framework of Constructivist Learning Environment on Learning Management System.

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References