Design of Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment

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ABSTRACT

The purposes of this research study were: 1) analysis and synthesis of Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment, 2) design of Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment, and 3) to evaluate Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment. The research procedures were divided into two phases. The first phase was to develop Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment, and the second phase was to evaluate Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment. The sample group in this study consisted of five experts in Instructional Design, Challenge-Based Learning, Information Technology, and Ubiquitous Cloud Learning Environment using purposive sampling. Data were analyzed by arithmetic mean and standard deviation. The research findings were as follows: (1) Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment consist of 1) Big Idea 2) Essential Question 3) The Challenge 4) Solutions : Implementation and 5) Evolution & Assessment and (2) The five experts have evaluated the learning activities showed highest suitability and The evaluation of challenge-based learning activities on ubiquitous cloud learning environment when really using have high suitability.

Keyword: Challenge-Based Learning, Learning Activities, Ubiquitous Cloud Learning Environment

1. Introduction

Learning and Teaching in the 21st century in line with the National Education Act B.E. 2542 and 2545, Section 22, requires that provision of learning must be based on the principle that every student can learn and self-develop. Students should be encouraged to develop naturally to their full potential. Also, Section 24 specifies that educational institutions and relevant agencies must arrange activities, learning environment and facilities in line with interests and aptitudes of students (Office of the Higher Education Commission, 2013). Apple Classroom of Tomorrow (2009)

explains that learning is an approach based on the challenge of applying the lessons in classes and workshops to challenge settlement to go through. learning through challenges involved teaching and learning methods in order to motivate the students in various technologies and facilities around them to solve real-world problems. Through this approach, students should implement assignments based on skills and interests, while the lecturer or other experts with challenging questions posed by the students and the students are trained to be brave act on the knowledge gained and practice sharing information and experience. Among the key features of this challenge based learning is the diversity of possible solutions and strategies, natural resources and relationships, opportunities to develop self-attitude, talent, hone basic skills to management and production technology, opportunities for students to do something rather than learning in class or workshop only, documenting the experience gained from solving challenges and finding information 24 hours a day (Catalina et al., 2013). CBL encourages the use of web and mobile technologies, such as collaborative tools, that are available to students but not often used in coursework. This model is frequently interdisciplinary in its approach and encourages projects that involve the wider community. The combination of allowing students to choose their challenge and tying these challenges to community interaction raises student investment in a productive outcome (Educause, 2012). The kind of learning that takes place in challenge-based projects is reinforced by action, and students will learn much from the implementation of their own ideas. Implementation is accompanied by major outcomes in terms of acquisition of 21st century skills such as communication, leadership, civic literacy, and social responsibility, among many others (Johnson et al., 2009). A key feature of challenge-based learning is that it appropriates the networking tools and media production techniques already being used in daily life by many 21st century learners. In preparing the final products of their research presentations of their chosen solutions students draw upon photography, videography, audio recording, and writing skills that they may already be using as web content producers. If they are not already doing those things, challenge-based learning provides an engaging opportunity for them to hone these kinds of high-level communication skills others (Johnson et al., 2009). The combination of that with the word learning denotes a learning model that allows learners to acquire knowledge anywhere by using mobile devices and wireless communication as tools. The learning recognizes learner's context. The so-called ubiquitous learning environment (ULE) (Jones, 2004). ULE is a setting that encourages pervasive study. Learning can happen anytime with a mobile devices mediating an access to knowledge sources. It complies with the current learning model and contributes to ICT literacy improvement as learners have the chance to practice various skills (Shih, 2010)

2. Literature Review

2.1 Challenge-Based Learning

Apple Computer Inc. has applied CBL to the collaboration project, Apple Classrooms of Tomorrow (ACOT), between public schools, universities, and research agencies with great success (Apple Inc, 2009). The Challenge-Based Learning Framework as shown in Figure 1.

Figure 1 : Challenge-Based Learning Framework

Challenge-Based Learning is implemented in this study as follows: Big Idea, Essential Questions, The Challenge, Solutions Implementation and Evolution & Assessment However, the CBL experience provides the opportunity to integrate a variety of alternative and authentic assessment tools. These tools are performance based in that students are not only expected to know the information but apply it in real-world situations. They also provide a longitudinal source of rich data that can be used to assess depth of knowledge and change over time (Catalina, 2013).

2.2 Ubiquitous Cloud Learning Environment (ULE)

The ubiquitous learning means a form of study encouraging pervasive education using mobile computer technology and wireless communication as a tool. The learning

recognizes learners context. A management of environment for u-learning is commonly known as ubiquitous learning environment (ULE). It is an adaptation of learning situation to stimulate pervasive study. Learning can happen anytime with a mobile computer mediating an access to learning sources (Phumeechanya, 2013). The ubiquitous learning environment in this research is integrated cloud computing technology♯that is mentioned at present. Consists of four components: 1) mobile devices 2) wireless communication 3) sensors and 4) notification. The learning in this environment will permit learners to develop their ICT literacy through practical use of devices with facilitation from instructors.

3. Purpose of the Research

3.1 Analysis and synthesis of Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment.

3.2 Design of Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment.

3.3 Evaluate Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment.

4. Research Methodology

4.1   Phase 1: Design of Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment. ♯

4.1.1 Relevant articles and research works are studied, analyzed, and synthesized to formulate a concept of the challenge-based learning activities on ubiquitous cloud learning environment .

4.1.2 Design the challenge-based learning activities on ubiquitous cloud learning environment based on the data obtained from the research study used in the formulation of the instructional design concept.

4.1.3 Present challenge-based learning activities on ubiquitous cloud learning environment is presented to advisors for consideration and modified it as guided.

4.1.4   Built the evaluation tools for evaluate the learning activities.

4.2   Phase 2: Evaluation and certification of the Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment

4.2.1 Present the designed activity to the experts from fields of instructional design, challenge-based learning and ubiquitous cloud learning environment for review and evaluates the suitability.

4.2.2 The designed activity is modified according to the experts suggestions.

4.2.3 After modification, the designed activity is presented in form of narrative diagram.

4.2.4 Analyze the results of evaluation of the activity by arithmetic mean ($\bar{x}$) and standard deviation (S.D.) consisting of 5 criteria for evaluation according to the idea of Likert's scale.

5. Results

5.1 Learning Activities

The challenge-based learning activities on ubiquitous cloud learning environment, the details thereof are shown in Figure 2., Learning activities took place in Ubiquitous Cloud Learning Environment. In other words, each learner used a portable computer (Smartphone or Tablet) as a learning tool; thereby, the learner could learn anything in any place where there was Wireless Communication (Mobile data or Wi-Fi), e.g. school areas, universities, home, public areas or the area with Mobile data service. The learning activities included 5 steps.
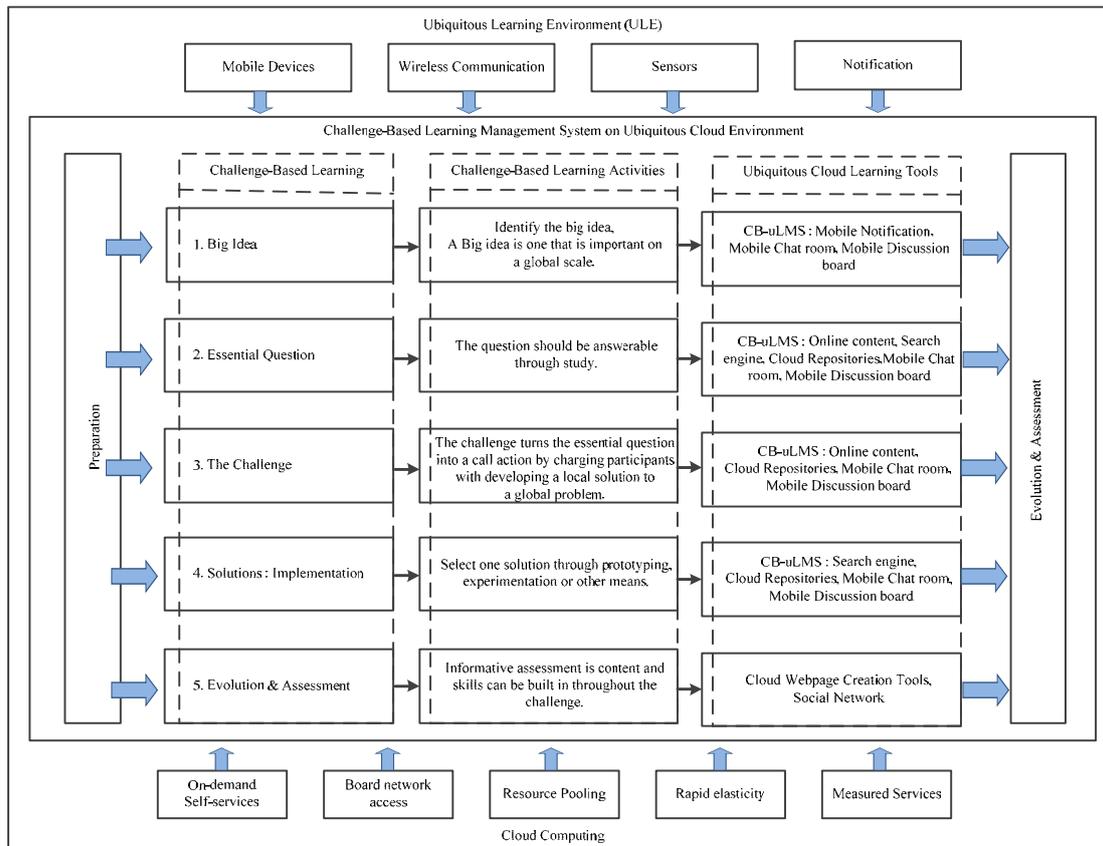

Figure 2 : Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment

5.1.1 Big Idea, Start by working with students to identify the big idea. A big idea is one that is important on a global scale and that students can work with to gain the deep multidisciplinary content knowledge and understanding that is required by the standards for their grade level. A good place to look for big ideas is in the major news stories of the day.

5.1.2 Essential Questions, Which serves as the link between your lives and the big idea. The question should be answerable through research, help focus students' efforts, and provide a framework for the challenge.

5.1.3 The Challenge, The challenge turns the essential question into a call to action by charging participants with developing a local solution to a global problem. A challenge is immediate and actionable. Choosing and setting up the challenge is crucial. If it is interesting and sufficiently close to home, students will derive personal meaning and feel a sense of accomplishment upon proposing and implementing a solution. If the challenge also has greater global significance, students will gain confidence and self-esteem as they engage with issues they know to be truly important.

5.1.4 Solutions : Implementation, They should select one solution through prototyping, experimentation, or other means. next, they fully research, document, and develop that solution and then identify steps to carry out their implementation plan.

5.1.5 Evolution & Assessment, Challenge Based Learning presents a wide variety of opportunities for assessment. Informative assessment of content and skills can be built in throughout the challenge, and the solutions to the challenge provide an excellent opportunity for summative assessment. traditional assessment methods can be used at many different points during the process.

5.2 Suitability Evaluation of Activities.

Evaluation results of the challenge-based learning activities on ubiquitous cloud learning environment. The evaluation is carried out by submitting the designed activity to the five experts for a certification on the suitability of its components, methodology, steps, activities, and for a test. The evaluation result by the expert has shown that the designed activity principle concept and objective have highest suitability ($\bar{x}$ = 4.52, S.D. = 0.51) illustrated in table 1, and The evaluation of challenge-based learning activities on ubiquitous cloud learning environment when really using have high suitability($\bar{x}$= 4.40, S.D. = 0.55) illustrated in table 2.

Table 1: The challenge-based learning activities on ubiquitous cloud learning environment

Evaluation List	$\bar{x}$	S.D.	Level of Suitability
1. Big Idea	4.40	0.55	High
2. Essential Question	4.60	0.55	Highest
3. The Challenge	4.60	0.55	Highest
4. Solutions : Implementation	4.20	0.45	High
5. Evolution & Assessment	4.80	0.45	Highest
Summary	4.52	0.51	Highest

Table 2: The challenge-based learning activities on ubiquitous cloud learning environment when really using

Evaluation List	$\bar{x}$	S.D.	Level of Suitability
Possibility of applying in real situation	4.40	0.55	High
Summary	4.40	0.55	High

6. Discussion

The expert's evaluation demonstrates that the components, steps, and activities of the model are highest suitable. The result also aligns with the research finding of suggesting that the Challenge-Based Learning Activities on Ubiquitous Cloud Learning Environment Consists of   1) Big Idea 2) Essential Question 3) The Challenge 4) Solutions : Implementation and 5) Evolution & Assessment. The expert's evaluation also reveals that the Challenge- Learning Activities on Ubiquitous Cloud Learning Environment high suitable for the possibility of applying in real situation. Challenge-Based Learning Management Activities following (Marin, Hargis, & Cavanaugh, 2013) were developed the structure of a Foundations English Language (FEL) course that integrates the use of Challenge Based Learning (CBL) and iPad mobile learning technology. the Center for Teaching and Learning (CTL) provided a follow up session of the CBL introduction solely to level three teachers in order to share the course outline with them and to familiarize them with how their current assessment structure would fit into the CBL course. Then, one faculty member made stories of CBL initiatives in the classroom.

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