Forging a Template of MOOCs Course Development Experience in Taiwan Higher Education

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ABSTRACT

With the development of Internet technologies, many school courses are put on the internet. However, high-quality online courses can be scarcely found in the fields of education or business training system. In order to provide learners with high-quality online courses, this paper intends to put forward some templates for the stage of designing online courses. Moreover, this paper shares the experience in producing the Internet of Things course. Accordingly, the purposes of this paper are: (1) to suggest the templates which may be beneficial to course designs, (2) to give a case example to guide the course development. Due to the limited time and expenses, the paper simply gives a direct and a mastery learning templates as examples. The results indicate that the templates would help team members to communicate and cooperate with one another during course-developing periods. The significance of this paper is to offer guideline for those who intend to produce high-quality online courses. paper must have an abstract. The abstract should be self-contained and understandable by a general reader outside the context of the paper.

Keywords: MOOCs, course design, instructional design, e-learning, higher education, Internet of Things.

1 Introduction

Massive Open Online Courses (MOOCs) is one of the e-learning models in the world. The reasons for the spreading of MOOCs in the e-learning market are due to the accessible technologies of Internet and the needs for global education. In order to

meet the urgent need, how to provide online courses, especially those high-quality ones, is a matter of importance.

There are many online courses on the Internet, but not all the online courses can be categorized into good e-learning courses. According to Clark and Mayer's (2011) definition, e-learning should have multimedia features. The most important elements of e-learning are the contents and instructional methods. Moreover, some studies argued that subject matter experts (SME) could use e-learning successfully based simply on three different types of courses. As a matter of fact, a successful e-learning course was provided when the SME and the instructional designer work together. The team members include not only the SMEs but also the instructional designers and engineers.

The Ministry of Education in Taiwan nowadays calls for e-learning model courses in order to help higher education systems to provide high- quality online courses. Although the Ministry of Education in Taiwan calls for online courses designed specifically for MOOCs, the team members of this study show a more interest in providing a template for designing high-quality online courses.

This paper intends to bring the experience of developing a MOOCs model course, the Internet things. At the same time, this paper attempts to provide a template to be followed while designing MOOCs. In order to achieve the purpose, a case, the first unit in the Internet of Things course, would be described in this paper. From the case study, some critical points related to the formation of a template are examined so that a useful template can be forged.

1.1 Purpose of the Research

This paper intends not only to develop a MOOCs model course but also to provide a template to be followed. In other words, to share the experience of developing a model MOOCs course in higher education in Taiwan is the main purpose of this paper. To reach the goal of developing a high-quality online model course for MOOCs, some instructional theories are needed to establish a theoretical framework.

The authors have reasons for establishing the purposes of the study. They are described as follows.

First, sharing the experience of developing an online course is one of the important purposes for this paper. Although we may find many online courses were presented around the world, there are not many universities taking part in the field of distance education. Universities, especially those who were supported by the government in Taiwan, would provide a few online courses. Because of this, it will be of significance to share this kind of developing experience not only in Taiwan but also in the world.

Second, this study attempts to analyze the procedure of developing a MOOCs course. Hence, forging a template will be feasible in terms of developing online courses. Due to many educational theories can be applied in the field of distance education, a template which is easily accessible is supposed to benefit more teachers or researchers.

2 Related Literature

This study attempts to share the experience of producing an online course for MOOCs. In order to provide a good-quality course, both the educational theory and the instructional design model for e-learning are needed. Accordingly, the educational theories, e-learning technologies, and instructional design models are applied in this study.

2.1 Educational Theory

Dr. Dewey (1934, 1958) and Dr. Maxwell (1881) emphasized that experiential learning will occur through the learning process in which students tend to create something of their own and make contributions to ultimate learning. Then, Dr. Piaget (1970) and Dr. Bruner (1971) turned a movement in curriculum and instruction for experience-based designs into college level courses.

2.2 Instructional Design Model

An instructional design is made to provide teaching blueprints, and to examine teaching and offer solutions. Accordingly, the practice of an instructional design is to target specific learners, select specific approaches, contents, and strategies, and make an effective teaching policy. An instructional design is often presented and explained through models (Smith & Ragan, 1999).

The application of an instructional design model is widely adopted (Michael,, Marlon, & Roberto, 2002) . Some studies made use of the instructional design model in the areas of innovation and evaluation For example, in innovation research area, Wang, Hong, Sung, and Hsu (2006) applied this method to get the validity of KeyGrap. The results indicated that although the statistic data showed no significant difference, Huang, Tsai, and Hsu, (2006), Tsai, Huang, Hong, Wang, Sung and Hsu (2006) used Keygraph technology and tried to find the chances in instructional activities(Hsu, Wang, Hong, Sung & Tasi, 2006 ; Hsu, Wang, & Hong, 2007). In the evaluation area, the learning outcome presented in figure 1 by Hsu, Hong, Wang, Chiu, and Chang (2009).

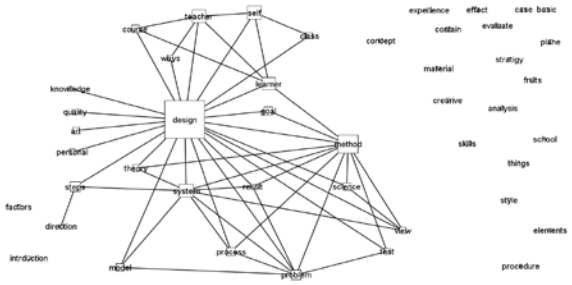

Fig1. The Association Map Value Word - Design

2.3 E-learning

Since the development of e-learning, a lot of studies on e-learning have been conducted worldwide, some of which are related to the present study. The application of technological media increases students' motivation for learning (Hsu & Chang, 2003) and keeps e-learning flourishing. In the past, e-learning was provided through a non-simultaneous web-based classroom platform, where teaching was facilitated by the use of a bulletin board, a teaching material zone, a discussion zone, and a homework zone (Hsu, She & Lin, 2000).

E-learning is a trend in education. For example, blogs, wiki systems, and game-based environments have been developing rapidly. The computer-assisted instruction technologies are also applied in e-learning (Hsu, Kuo, 2000). Hsu, Song, Chang and Yen (2006) using team teaching approach in e-learning was another aspect in e-learning research.

One of the benefits of e-learning course is for disadvantaged students to learn because the learners can learn by anytime, anyplace and any topic which they want to learn repeatedly. Hsu, Wang, and Lin (2010) indicated that e-learning courses for disadvantaged students would make them feel more confidence in themselves (Hsu, & Lin, 2011).

3 Method - Forging Templates of the Online Courses

In order to develop the online course, the Internet of Things course, there were some templates which had been forged.

3.1 Forging the templates

First, a course outline sheet (see figure 1) was designed to be filled in during the class. This course outline sheet was intended to be filled in by a subject matter expert (SME) and an instructional designer, who worked together to complete the course outline sheet. The SME was responsible for the provision of ideas for the course content. As to the rest of the items, the SMEs were requested to discuss with the instructional designers, and then wrote down their ideas in such items as instructional objective, bloom taxonomy, teaching strategies, evaluation, and remark.

Course Content	Instructional Objective	Bloom Taxonomy	Teaching Strategies	Evaluation	Remark

Fig. 2. The Course Outline Sheet

There was another sheet which was a checking list. It was showed in figure 2, for the course presentation. This checking list was for the direct lecture course.

Content analysis	Gain attention	Inform learners of objectives	Stimulate and Recall of Prior Learning	Present the Content	Provide Learning Guidance	Elicit performance	Provide Feedback	Assess performance	Enhance Retention and Transfer
Total									

Fig 3. The Check List for Course Presentation

4 Case Demonstration – One Section of the First Unit in the Internet of Things Course

The procedure of the research model for developing the online course by employing templates was described below:

Step 1: Through several meetings, discuss the online course sheet completed.

Course Content	**Instructional Objective**	**Bloom Taxonomy**	**Teaching Strategies**	**Evaluation**	**Remark**
1-1 Definition	Understanding the definition	6 levels	Mastery learning	Multiple-Choice Discussion Homework	

Fig. 4 Sample of Internet of Thing: Unit 1

Step 2: According to the online course sheet, develop the online course.
Step 3: Based on the instruction presentation, a check list of the presentation was counted.

Content	Gain attention	Inform learners of objectives	Stimulate recall of prior Learning	Present the content	Provide learning guidance	Elicit performan	Provide feedback	Assess performan	Enhance retention
00:00～00:11	X								
00:12～00:27	X	X							
00:28～03:15	X	X				X			
03:16～04:40		X		X		X			X
04:41～05:26			X			X			X
05:26～06:51		X							
06:52～08:07		X		X					X
08:08～09:56		X	X						X

09:57～11:09		X			X				X
11:10～11:42	X	X		X					X
11:43～13:42			X	X		X			X
13:43～14:51			X	X					X
14:52～16:40	X		X	X					X
16:41～19:10	X		X	X					X
Total	6	8	6	7	1	4	0	0	10

Fig. 5 Analyzing the Instruction According to the 9 Events

Course Content	**Instructional Objective**	**Bloom Taxonomy**	**Teaching Strategies**	**Evaluation**	**Answer**	**Feedback**
1-1				**Multiple choice** **1** **2** **3** **4** **5** **6** **7** **Discussion** **Homework**	**1** **2** **3** **4** **5** **6** **7**	**Refer back to 03:16** **Refer back to 16:41** **Refer back to 03:16** **Refer back to 09:57** **Correct answer** **Refer back to 11:43** **Refer back to 13:43** **Comments** **Grading**

Fig.6 Analysis Practice for Master Learning

Step 4: According to the mastery learning & teaching strategies, the course outline sheet was verified in the remark column below.

Step 5: Group met again in order to justify the instructional presentation and to add more information to revise this version.

Step 6: Repeated the steps in the course development for unit one.

5 Conclusions and Suggestion

Although the templates for developing online course were not difficult to forge, different and correct methods were needed to fit in the variety of teaching strategies. The case presented in this study indicated that the cooperation among subject matter experts, instructional designers, and e-learning engineers was the key factor in

developing a high-quality online course. As long as the good templates can be forged, it is would be easy to design high-quality online courses.

5.1 Conclusion and Discussion

The results of this case presentation indicated that the templates forged might contribute to the course development. It was necessary for the team members to cooperate in order to develop the high-quality online course, despite the fact that it was time consuming. Different instructional theories lead to different teaching methodologies. Due to the time limitation, this paper simply put forward the direct teaching and mastery learning teaching strategies. There are some other teaching methods. Laboratory experience proceeding inquire is one of them. Each category may ask for applying a specific template to make the online course quality-proved. It is the time and money limitation which makes it impossible to provide whole templates for special course designs.

5.2 Suggestion

This paper intended to design templates for developing online courses to help who would like to provide online courses in education system or business training. There are some suggestions to make:

- To such organizers as schools or companies:
  Supports are needed in developing high-quality online courses, which is a task that is time and money consuming.
- To the development team:
  The team members would be composed of subject matter experts, instructional designers, and online engineers. The ways of communication between them may vary from one to the other; however, the execution of a team work is extremely important for the realization of a high-quality online course.

Finally, this paper submitted just one example course that was not sufficient for the purpose of generalization probes. Further studies on the experience of developing the online courses are needed. By doing so, it may lead to a good effect on online course studies. Simply put, more research on high-quality online courses is needed.

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