The Learners’ Effectiveness and Satisfaction toward Online eLearning Contents: A Comparison between a Computer Lab and a Lecture-Based Class at Mahasarakham University (MSU)

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Abstract

The eLearning (eLearning or online learning) is learning through electronic means with the Internet as the renowned choice. The survey in 2005 with regarding the University-Level eLearning in ASEAN showed more and more universities in Asia were getting into the global eLearning transition and competition. As stated by the father of modern management, Peter Drucker, eLearning will be of equal importance as eCommerce and will inevitably be promoted everywhere in the world as part of the information society.

At the heart of eLearning quality assurance lies 5 pillars included learning effectiveness, cost effectiveness and institutional commitment, access, faculty satisfaction, and student satisfaction. As accessing has become more widely permitted through the open courseware and the like with reduced eLearning cost as a result, more eLearning employment should yield higher achievements in learning effectiveness, and faculty and student satisfaction toward eLearning. Among four components of eLearning included contents, LMS (Learning Management Systems), communication, and evaluation; the quality of learning material or online eLearning content gets more challenging as it is the main criteria in teachers’ up-to-date skills and students’ learning quality.

This research aimed to study the online eLearning contents developed using the DIY (Do-It-Yourself) content development approach called E-ADDIY model. The sample of 114 MSU students taking a computer lab and 101 MSU students taking a computer lecture course had been purposively selected as the subjects to demonstrate the result in both types of study orientations. The sample was divided into the control and experiment group: the experiment group watched online contents where the control group took face-to-face class. The experiments had been completed with satisfied results. For the computer lab class, the experiment group was satisfied with the eLearning contents at the mean of 3.44 and got the effectiveness index (E.I.) at 0.4089. For the computer lecture class, the experiment groups were satisfied with the eLearning contents at the mean of 3.30 and 3.35. The experiment group also got higher posttest mean score of 27.56 vs. 22.37 with t-test at p<=.01. In addition, the study showed subjects in both types of classes preferred to use eLearning as supplement to the traditional teaching at 90.32% and 87.63%.

The final objective of this research is to provide an alternative to online content development approach and to study the
effectiveness and satisfaction of learners toward the developed online contents.

Keywords: E-ADDIY, ADDIE, IMMCAI, DIY, Do-It-Yourself, eLearning

1. Introduction

The advance in information technology supports eLearning in adding new learning experiences and promoting life long learning. In 2003, World Bank stated that “Lifelong learning is education for the knowledge economy.” This can be derived that the flexibility provided by eLearning can strengthen the knowledge economy similar to what lifelong learning means to the education. This brings importance to quality as a successful key ingredient contributed to the eLearning.

Thanomporn Laohajaratsang (cited in 5) had defined four components of eLearning include Content (one most important factor but still lacking in Thailand), Management (use of LMS or Learning Management Systems), Communication (either synchronous or asynchronous), and Evaluation (e.g. pre or posttest). Both communication and evaluation components are mostly incorporated into the LMS. Moodle is one of the well-known and very popular LMS. With its easy to use interface, Moodle features webboards, blogs, lessons, questions bank, quizzes, etc. It also supports SCORM for shareable contents with different LMS (http://moodle.org).

Considered the most important eLearning component, eLearning content can be in any forms e.g. discussion forum, interactive multimedia, simulation or game-based learning. It can be just plain text, presentation slides, document files, web pages, flash animations, etc. pertain that it supports teaching-learning process or outcomes, and supports or be a part of a particular course. The content with the mixture of text, diagrams, or video content is considered media rich and hence can help achieve quality eLearning.

2. The Approaches to eLearning Content Development

Developed in 1975 by the Florida State University, ADDIE model of Analysis, Design, Development, Implementation, and Evaluation was selected by the military as the means for developing training and usually known as ISD (Instructional Systems Design).7

Thanomporn Laohajaratsang8 had proposed CMU-SAM model as an approach to develop high quality eLearning courseware. The model included 7 main stages (which could be further divided into altogether 14 stages) which also centered on ADDIE. Similarly, Pairoj Teeranatanakul (cited in 5) had adapted ADDIE into IMMCAI (Interactive Multi-Media Computer Assisted Instruction) model having 5 main stages which could be subdivided into 16 detailed stages. Noticeably, for those modified versions of ADDIE model for content development, all of which required a cumbersome involvement of expert staffs6,8,9 and a lot of budgets. For example, a “Research Design” eLearning (available at http://www.elearning.nrc.go.th) had 30 hours of content duration but needed 10 man-month, 5 experts, and 500K baht to develop. These approaches are popularly employing as Laohajaratsang8 mentioned “…instructors should not be expected to complete the technical tasks associated with the development. Therefore, it is necessary to form a development team.” This problem strengthens the hidden chronic dilemma of quality vs. costly, time consuming, and expert-only issues in content development. As a result, some eLearning establishments proposed the use of less media-rich contents9 as available.
This research study proposed the DIY (Do-It-Yourself) approach in online content development as a contradicted alternative to other high-quality and prestigious development techniques using team of experts. We named it E-ADDIY\(^5\) as shown in the figure below with two constructs. Firstly, the Y, “You,” or “Yourself” were the person involving in all Analysis, Design, Development, and Implementation aspects of content development. Secondly, the E or Evaluation was at the heart of our online content development approach. The evaluation will always permeate through all stages of content development not just the end of the process. In E-ADDIY, all works will be originated and continuously managed by the instructor or content expert instead of the team of developer. See figures below.

![The E-ADDIY model](image1)

**Figure 1 The E-ADDIY model**

![MIS’s content from E-ADDIY model](image2)

**Figure 2 MIS’s content from E-ADDIY model**

The purpose of this research was to develop the eLearning contents, put them for experiment, and studied the learners’ effectiveness and satisfaction. The contents were developed as streaming flash video using Techsmith Camtasia 3.0. They were hosted on the Moodle LMS which also acted as a means for management, communication, and evaluation activities.

3. Research Methods

The research was done on two courses at Mahasarakham University: a computer lab (ITA: Information Technology Application) and a computer lecture course (MIS: Management Information Systems) in the first semester of 2007.

For ITA, the sample of 114 students (2 sections) taking ITA was purposively selected using one section for \textbf{CGRP}\(^\text{\textsuperscript{5}}\) denoted the control group (52 students) and another for \textbf{XGRP}\(^\text{\textsuperscript{5}}\) denoted the experiment group (62 students). For MIS, the sample included 101 students (2 sections with 46 and 55 students) taking MIS. Each section played both roles of the experiment interchangeably. After analysis, data from only 97 subjects were usable included 43 and 54 subjects from Sec1 and Sec2 accordingly.

In ITA, only excel content was focused in the experiment. In MIS, however, all 8 chapters were focused (with first 4 chapters as midterm and last 4 chapters as final experiment). The experiment steps included (with some variants) complete the demographic questionnaire, complete pretest (if any), watch online content or study face-to-face, complete posttest or lab test (if any), and complete follow up survey. The dependent variables included learning effectiveness and learner’s satisfaction. The data was analyzed via statistical software using descriptive statistics e.g. freq. count, percentage, means, and std.dev. In addition, t-test and effectiveness index had been analyzed to find the learning effectiveness.
4. Results and Discussion

The demographic data from ITA course shown 96 subjects or 84% were female, 64 subjects or 56% were from the faculty of science, 76 and 34 subjects or 67% and 30% were in freshmen and junior respectively, 108 subjects or 95% registered for the first time and 82 subjects or 72% never study in any eLearning courses before. The demographic data from MIS course shown 56 subjects or 57.73% were female, 94 subjects or 96.91 were in junior year, 93 subjects or 95.88% registered for the first time and 56 subjects or 57.73% had studied in some eLearning courses before.

Learning effectiveness: For ITA, the calculated effectiveness index (E.I.)\(^{10}\) of XGRP vs. CGRP were 0.4089 vs. 0.5838 which means the learners in XGRP had increased knowledge at 0.4089 which is 40.89% compared to CGRP at 0.5838 or 58.38%. Both groups got improvements in their posttest and pretest mean scores (XGRP at 2.85 vs. 1.37 and CGRP at 3.52 vs. 1.44). For the lab test score, XGRP received mean score of 15.45 compared to CGRP at 14.67. See table 1-2 for the statistical data’s details.

Table 1 Posttest vs. pretest score of XGRP

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<th>Mean</th>
<th>St.dev.</th>
<th>t Stat</th>
<th>p</th>
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<tr>
<td>Posttest</td>
<td>2.85*</td>
<td>1.04</td>
<td>8.89</td>
<td>0.00</td>
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<tr>
<td>Pretest</td>
<td>1.37</td>
<td>0.85</td>
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*\(p<=.01\)

Table 2 Lab test score of XGRP vs. CGRP

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<th>Mean</th>
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<tbody>
<tr>
<td>XGRP</td>
<td>15.45</td>
<td>3.02</td>
<td>1.21</td>
<td>0.11</td>
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<tr>
<td>CGRP</td>
<td>14.67</td>
<td>3.72</td>
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For MIS, XGRP in the midterm experiment (Sec2) had 39 subjects or 72.22% watched online contents over 50% compared to XGRP in the final experiment (Sec1) having 33 subjects or 76.74%. For the midterm experiment, XGRP (Sec2) got the average midterm exam score of 16.41 or 54.69% where CGRP (Sec1) got 16.86 or 56.20%. In the final experiment, XGRP (Sec1) got the average final exam score of 27.56 or 68.90% where CGRP (Sec2) got 22.37 or 55.93%. See table 3 for the details of statistical data.

Table 3 Final exam score of XGRP (Sec1) vs. CGRP (Sec2)

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<th>Mean</th>
<th>St.dev.</th>
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<tbody>
<tr>
<td>XGRP</td>
<td>27.56*</td>
<td>5.84</td>
<td>4.34</td>
<td>0.00</td>
</tr>
<tr>
<td>CGRP</td>
<td>22.37</td>
<td>5.85</td>
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Learner’s satisfaction toward knowledge from online content: For ITA, XGRP rated its satisfaction at satisfy level (32 subjects or 51.61%, overall mean = 3.44). Its 56 subjects or 90.32% also rated the utilization of online contents for using as supplement to instructors’ teaching. For MIS, XGRP in the midterm experiment rated its satisfaction at satisfy level (overall mean = 3.30) compared to XGRP in the final experiment at satisfy level (overall mean =3.35). For the utilization of online content, 50 subjects or 92.59% of XGRP in the midterm experiment rated for using as supplement to instructor’s teaching compared to 35 subjects or 81.40% of XGRP in the final experiment which rated the same answer.

In terms of learning effectiveness, ITA experiment showed improvement of posttest vs. pretest score for both groups with t-test results at significant level, \(p<=.01\). The lab test score at 15.45 vs. 14.67, however, didn’t show any significant. XGRP got effectiveness index at 0.4089 less than CGRP at 0.5838 maybe due to most students in CGRP were in the third year and had more learning experiences. For MIS, both groups got similar mean score for midterm experiment. However, XGRP in the final experiment got higher final mean score of 27.56 vs. 22.37 with t-test at significant level, \(p<=.01\) probably as a result of higher percentages of online contents watching.

For learners’ satisfaction regarding the knowledge received from the study, all groups rated their satisfaction at satisfy level.
This should confirm the teaching quality of the instructor (face-to-face or eLearning) at a satisfactory level. However, in ITA, CGRP rated its satisfaction with mean of 3.13 compared to XGRP at 3.44 as a result of poor computing facilities and slow internet speed. With regards to utilization of online content, quality of contents should be improved so that it could replace the instructor’s teaching.

5. Conclusion

Compared to other ADDIE based models, using the DIY approach or E-ADDIY model with the content expert as the developer or other needed experts could achieve digital contents with the shortest amount of time, cheapest expense, and lowest skilled labors need. Although the created contents maybe of lower quality, our experiments had shown similar or better results comparing to traditional face-to-face teaching with regards to learning effectiveness and learners’ satisfaction. The future research will focus on improving quality of the online contents to replace the instructor’s teaching, online contents sharing and reviewing, and transferring knowledge in content development to other interested academics.

References