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# The Development of the Electronic Book on “Construction Technology 5 for Students of Architecture”

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**Abstract:** *This research aims to 1. develop the electronic book on “Construction Technology 5 for Students of Architecture” 2. find the efficiency of the electronic book under the 80/80 criteria and 3. compare learners’ achievement during, before and after learning from the electronic book.*

*The sample used in this research includes the nine junior students of the Department of Architecture, Faculty of Engineering and Architecture, Rajamangala University of Technology Suvarnabhumi, Nonthaburi Campus who studied the Construction Technology 5 course in the second semester of Academic Year 2014, by having a pretest. In addition, the sample used the electronic book produced by the researcher, did exercises and took a posttest. The data were analyzed by Percentage, Mean, Standard Deviation and Coefficient.*

*The study shows that the efficiency of the electronic book on “Construction Technology 5 is 88.50 percent, which is higher than the criteria set forth. Meanwhile, the students’ achievement after learning is higher than that before learning. There is a difference with statistical significance at 0.01.*

**Keywords:** *Electronic Book, Architecture, Rajamangala*

## 1. INTRODUCTION

Education in a learning society has led to a rapid educational change and modern education. Knowledge and innovation have been applied to the development of a large number of electronic technologies in education, promoting e-learning to respond to humans’ needs and minimize the limitation of a normal learning. Construction Technology 5 course is essential for all students of architecture. The researcher wishes to improve the efficiency of the electronic book on “Construction Technology 5 for Students of Architecture” to make sure the electronic book is suitable for self-learning, regardless of place and time and increase educational opportunity.

The objectives of this research include 1. the development of the electronic book on “Construction Technology 5 for Students of Architecture” 2. the finding of the efficiency of the electronic book under the 80/80 criteria and 3. the comparison of learners’ achievement during, before and after learning [1-5].

## 2. DESCRIPTION

1. Study related documents and researches.
2. The population used in this research includes the nine junior students of architecture of Rajamangala University of Technology Suvarnabhumi, Nonthaburi Campus.
3. Tools used in this research consist of the electronic book on “Construction Technology 5” created by Adobe Acrobat 5, comprising...
  - 3.1 Preparation for Construction
  - 3.2 Building with Wide Connection
  - 3.3 Roof Structure
  - 3.4 Construction of Readymade Building
  - 3.5 Digging Machine
  - 3.6 Laborsaving Device for Lifting and a pretest and a posttest.
4. The Production of the Electronic Book: The electronic book is produced by collecting contents from different books, establishing the behavioral objectives of the electronic book and preparing the charts and the design of the electronic book. The electronic book has been improved following experts’ advice.
5. The electronic book has been tested by seven students of architecture in the experiment group.
6. Improve the electronic book on “Construction Technology 5”.

7. The electronic book on “Construction Technology 5” has been brought for actual use.
8. Test and collect data.
9. Data Analysis
10. Statistics Used for Data Analysis

### 3. MATERIALS AND METHODS

1. The population and sample include the nine junior students of architecture of the Faculty of Engineering and Architecture, Rajamangala University of Technology Suvarnabhumi, Nonthaburi Campus.
2. Tools Used for Data Collection: The researcher studied documents and the book on “Construction Technology 5”.
3. The Creation of Tools Used for Data Collection
  - 3.1 The Production of the Electronic Book on “Construction Technology 5”: Study the descriptions of the courses for the Undergraduate Architecture Program.
  - 3.2 The Creation of Pretest and Posttest
  - 3.3 Study related academic books and researches.
  - 3.4 Present the electronic book to experts for content validity.
  - 3.5 Improve the electronic book and use it with students who are not the sample.
  - 3.6 Analyze the result to find difficulty index and discrimination.
  - 3.7 Analyze and find reliability.
  - 3.8 Apply the pretest and posttest to data collection.
- 3.9 Data Collection: The researcher applies the electronic book, the pretest and the posttest to the sample.
- 3.10 Data Analysis
- 3.11 Statistics Used for Data Analysis: The data are analyzed by SPSS for Windows.

### 4. RESULTS

The mean of the quality evaluation of the electronic book on “Construction Technology 5 for Students of Architecture” of Rajamangala University of Technology Suvarnabhumi, Nonthaburi Campus is 2.39 – 3.00. The high quality is for the following aspects: 1. Introduction 2. Contents 3. Language Usage 4. Course Designing and 5. Learner and Media Designing Components. Meanwhile, the moderate quality is for multimedia component. In general, the quality evaluation of the electronic book on “Construction Technology 5” is very high with the mean of 3.54, equaling 88.50 percent. The reasons are because its presentation is perfect, and the electronic book meets the objectives of

learning promotion. In addition, the electronic book enables learners to improve their learning skills and attitude. By these reasons, the quality of the electronic book is higher than its target of 80 percent.

**TABLE 1: The Overall Summary of the Quality Evaluation of the Electronic Book on “Construction Technology 5 for Students of Architecture”**

Topics	$\bar{x}$	SD	Feedbacks
Introduction	3.14	0.67	High
Contents	3.71	0.4	Very High
Language Usage	3.78	0.87	Very High
Course Designing	3.72	0.71	Very High
Multimedia Component	3.69	0.92	Very High
Learner and Media Designing Components	3.18	0.73	High
<i>The Overall Quality Evaluation of the Electronic Book on “Construction Technology 5”</i>	<i>3.54 or 88.50%</i>	<i>0.72</i>	<i>Very High</i>

### 5. CONCLUSIONS

1. The results show that the efficiency of the development of the electronic book on “Construction Technology 5 for Students of Architecture” produced by the researcher achieves the 80/80 criteria. Therefore, the electronic book on “Construction Technology 5” can be used as a learning material for students of architecture.
2. The electronic book on “Construction Technology 5” consists of computer media, enables learners to learn via several channels and encourages the learners to read the electronic book to improve their learning efficiency.
3. The production of the electronic book must be planned systematically. The planning includes flowchart/ story board drawing and the preparation of illustrations to minimize the production time and problems.
4. Most of the programs in the electronic book are used for printing documents and displaying results on the screen, which is not different from other documents. After the documents are used for the production of the electronic book, the learning outcome is improved. By this reason, faculties should produce electronic books to be used for learning in classes and self-learning.

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**REFERENCES**

- [1] Sathapngern, K. The Effects of Using Lesson Program and TV Tape on Learning Science about Water Resources. Bangkok: The Thesis of Master of Education, Kasetsart University, 1994.
- [2] Malithong, K. Education Technology and Innovation. Bangkok: Chulalongkorn University Press, 2000.
- [3] Kriengsak C. "E-learning: Learning Strategies for the Future" ThaiCAI: E-learning. Source: <http://www.thaicai.com/articles/e-learning.html>, August 15, 2003
- [4] Pichaisawasdi, K. The Production of Electronic Document: Library Used by The Mathayom Suksa 1 Students of Wat Buddha Bucha School, Bangkok, 2002.
- [5] <http://www.thaicai.com/articles/multimedia.html>, August 15, 2003