

**Universiti Teknologi MARA**

**AbaKu: An Abacus Teaching and  
Learning Courseware**

**Nur Safawate Binti Mohd Shaari**

**Thesis submitted in fulfilment of the requirements for  
Bachelor of Information Technology (Hons.) Business Computing  
Faculty of Computer and Mathematical Sciences**

**January 2018**

## STUDENT DECLARATION

I certify that this thesis and the project to which it refers is the product of my own work and that any idea or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

  
.....  
NUR SAEAWATE BINTI MOHD SHAARI  
2015125797

JANUARY 21, 2018

## ABSTRACT

The learning session using abacus has been emphasized in mathematics subject for students in primary school. With the advancement of technology during this era, the way to deliver education to students in school will be more exciting. Moreover, if the method of the delivery is involving games, it also can improve the student's understanding based on what they have learned. According to the current abacus learning sessions, most of the schools use only textbooks as their guides. Therefore, the students are required a lot of efforts to understand on what their teachers have taught. The purpose of developing this courseware is to provide an additional learning tool for students to learn how to use the abacus for calculation. Furthermore, teachers and parents can use it as a teaching tool. The proposed courseware helps to attract the students to learn by implementing multimedia and gamification elements in this courseware. In this project, this courseware was developed by using ADDIE Model which consists of five stages, starting with the analysis, design, development, implementation and the last stage is the evaluation. This courseware was evaluated by the three experts to examine the functionality and usability of AbaKu Courseware. In fact, the evaluation also involved 30 respondents by distributing the questionnaires about courseware. Based on the results collected, most respondents are satisfied with the AbaKu Courseware interface with the highest mean which is 4.63 (SD = 0.49). In conclusion, AbaKu Courseware can be an additional tool and learning aids at school and home for students, teachers and parents. However, the courseware can be improved by adding more interactive elements in the future development.

## TABLE OF CONTENTS

<b>CONTENT</b>	<b>PAGE</b>
<b>SUPERVISOR APPROVAL</b>	ii
<b>STUDENT DECLARATION</b>	iii
<b>ACKNOWLEDGEMENT</b>	iv
<b>ABSTRACT</b>	v
<b>TABLE OF CONTENTS</b>	vi
<b>LIST OF FIGURES</b>	ix
<b>LIST OF TABLES</b>	xi

### **CHAPTER ONE: INTRODUCTION**

1.1 Introduction	1
1.2 Problem Statement	2
1.3 Project Objective	4
1.4 Project Scope	4
1.5 Significance of Project	5
1.6 Project Framework	6
1.7 Gantt chart	8
1.8 Conclusion	8

### **CHAPTER TWO: LITERATURE REVIEW**

2.1 Introduction	10
2.2 Abacus	10
2.2.1 Abacus Lessons	11
2.3 Multimedia Courseware	13
2.3.1 Elements of Multimedia	14
2.3.2 Benefits of Multimedia	15
2.4 E-learning	16

2.4.1	Impact of e-learning	16
2.5	Gamification	17
2.5.1	Benefits of Gamification	18
2.5.2	Elements of Gamification	18
2.5.2.1	Level and badges	19
2.6	Multimedia Development Model	20
2.6.1	Gagne's Model	20
2.6.2	ADDIE Model	22
2.6.3	ARCS Model	23
2.7	Similar Project	24
2.7.1	Know Abacus Application	24
2.7.2	E-Learning for Kids Website	25
2.7.3	Math picture Puzzle Game Application	25
2.8	Implication of Literature Review	26
2.9	Conclusion	27

### **CHAPTER THREE: METHODOLOGY**

3.1	Introduction	28
3.2	Methodology Overview	28
3.2.1	Preliminary Investigation	29
3.2.2	Analysis	29
3.2.3	Design	31
3.2.4	Development	35
3.2.5	Implementation	35
3.2.6	Evaluation	36
3.2.7	Documentation	37
3.3	Conclusion	38

### **CHAPTER FOUR: ANALYSIS AND DISCUSSION**

4.1	Introduction	39
4.2	Improvement of Business Process	39