

UNIVERSITI TEKNOLOGI MARA

**SCAFFOLDING AGENT
AS PEDAGOGICAL TOOL TO ASSIST
SENTENCE COMPOSITION IN
BAHASA MALAYSIA**

SUHADA BINTI MAT ZIN

Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Computer and Mathematical Sciences

March 2017

ABSTRACT

The big question is and has always been how to best promote robust learning in the resource-constrained classroom environment. One of the strong answers is by providing and improving tailored support to the learners in their Zone of Proximal and this can also be accomplished by the role of computer application. Nevertheless, an emerging of focus is on the potential of computer application to provide cognitive support for the students engaging in intellectual activities as the use of it in interactive learning environment is a challenging process and increases numerous questions about the design of its interface elements as well as the interaction of teachers, tools, and students in the classroom environment. Nowadays attention has been focused on the role of teachers and curriculum materials in scaffolding students. Drawing upon this, this study seeks to examine how effective the scaffolding is designed to enhance the student in process of composing sentence, targeting on primary school students, year 9 - 10. It examines the use of scaffolds designed into a computer assisted application with the presence of pedagogical agent; Scaffolding agent. The study was based on a constructivist learning theory and it implemented a qualitative methodology, namely; observation, questionnaire and interview. Twenty students and five teachers from a primary school were randomly assigned for experimental session. Results of the study revealed the learnability of the courseware and the presence of scaffolding agent in the courseware was the key factor that promotes composition skills and gave educational outcomes in composing Bahasa Malaysia sentences. Thus, confirming the computer aided design embedded with Scaffolding agent can assist student in a number of ways of Bahasa Malaysia sentence composition.

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful

Alhamdulillah, all praises to Allah for the strengths and His blessing in completing this thesis. I wish to acknowledge many people who have inspired and supported me in many different ways throughout this journey. First, I wish to thank my supervisor Dr Marina Ismail who graciously gave her time to guide me throughout this study, ploughed through several preliminary versions of my text, making critical suggestions and posing challenging questions. Her expertise, invaluable guidance, constant encouragement, understanding, and patience added considerably to my experience. Without her continual inspiration, it would have not been possible to complete this study.

I also would like to graciously thank a number of people for their advice, patience and support during the whole period of this research. In particular, I would like to thank panel of examiners Dr Shuhaida Mohamed Shuhidan and Assoc. Prof. Dr. Azlina Ahmad for their valuable suggestions that have been very helpful for this study. I also want to extend my thanks to the staff of FSKM and IPSIS for their help for every challenge I encountered.

I dedicate my efforts in completing this thesis to my beloved parents,
and for your prayer, dedication and many
years of support during my studies. Last but not least, endless thanks to my siblings
and friends for their readiness to understand and support me from start to finish.

TABLE OF CONTENTS

CONFIRMATION BY PANEL OF EXAMINERS

AUTHOR'S DECLARATION

ABSTRACT

ACKNOWLEDGEMENT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE: INTRODUCTION

- 1.1 Research Background
- 1.2 Problem Statements
- 1.3 Research Objectives
- 1.4 Research Scope
- 1.5 Significant of The Study
- 1.6 Contribution of The Study

CHAPTER TWO: LITERATURE REVIEW

- 2.1 Malaysian Education System
- 2.2 Bahasa Malaysia Writing in Primary School
- 2.3 Malay Sentence Structure
- 2.4 Scaffolding as Teaching Strategy
 - 2.4.1 Scaffolding Agent
 - 2.4.2 Software Agent
- 2.5 Teaching Technique
- 2.6 Learning Theories
 - 2.6.1 Active and Passive Learning Theory
 - 2.6.2 Constructivism
 - 2.6.3 Learning Assessment

2.7 Courseware as Language-Learning Material	35
2.8 The Potential Benefits of the Courseware in Learning Process	39
2.9 Cognitive Load	42
2.10 Interactivity	45
2.11 Usability	47
2.12 Related work	48
2.12.1 Scaffolding in Learning Material	49
2.12.2 Technology as Cognitive Tool	49
2.12.3 Affordances of Technology in Student Learning	51
2.12.4 Learning Assisted Systems and Software Agent	52
2.12.5 The used of Agent Prompts for Productive Reflection	53
2.12.6 English Composition Support System	54
2.13 Conclusion	55
CHAPTER THREE: METHODOLOGY	56
3.1 Research Design and Method	56
3.2 Requirement Gathering	57
3.3 Requirement Specification	61
3.3.1 Participants	61
3.3.2 Sentence Composition with Interactive Multimedia	61
3.3.3 Experiment Setting	62
3.3.4 Ethical Consideration	63
3.4 Design	64
3.4.1 Sentence Composition	64
3.4.2 System Architecture	65
3.4.2.1 Scaffolding Agent	65
3.4.2.2 Lesson module	66
3.4.2.3 Question module	67
3.4.3 Prototype	67
3.5 Evaluation	70
3.5.1 Observation	70
3.5.2 Questionnaires	71
3.5.3 Interview	72