UNIVERSITI TEKNOLOGI MARA

INTERACTIVE WEB-BASED COURSEWARE FOR SPM MATHEMATICS USING GAGNE'S NINE EVENTS OF INSTRUCTION

NURUL HIDAYU BINTI MUHAMMAD KHAIRUDDIN

BACHELOR OF INFORMATION SYSTEMS (Hons.) BUSINESS COMPUTING

FEBRUARY 2026

TABLE OF CONTENT

SUPERVISOR APPROVAL i
STUDENT DECLARATION ii
ACKNOWLEDGEMENT iii
ABSTRACT iv
LIST OF FIGURES vi
LIST OF TABLES vii
LIST OF ABBREVIATIONS viii
CHAPTER 1 1
1.1 Background of Study 1
1.2 Current Learning Process 2
1.3 Problem Statement 3
1.4 Objectives 6
1.5 Project Scope 6
1.6 Significance 7
1.7 Project Framework 8
1.8 Gantt Chart 9
1.9 Conclusion 10
CHAPTER 2 11
2.1 Introduction 11
2.2 Overview of E-learning 11
2.2.1 E-learning VS Face-To-Face Learning 12
2.3 Multimedia 13
2.3.1 Multimedia content 13
2.4 Courseware 17
2.5 Web-Based Multimedia Applications 18
2.5.1 Advantages and Disadvantages of Web-Based Multimedia Application 18
2.6 Multimedia in Mathematics teaching 18
2.6.1 Overview of Mathematics 19
2.6.2 KSSM Mathematics 19
2.7 Gagne's Nine Events of Instruction 20
2.7.1 Gain Attention 22
2.7.2 Inform learner of Objective 22
2.7.3 Prior Learning 22

4.1 Introduction 54
4.2 Learning Process Improvement 54
4.2.1 Current Learning Process VS SPMVisionMath 54
4.2.2 Requirements Applied in SPMVisionMath 55
4.3 SPMVisionMath: The Interactive Web-Based Courseware for SPM Mathematics using Gagne's Nine Events Instruction 56
4.4 Exploring SPMVisionMath 59
4.5 Functionality Testing 67
4.6 User Evaluation 71
4.6.1 Demographic Profile 72
4.6.2 User Evaluation Result 73
4.7 Discussion 74
4.8 Project Summary 76
4.9 Conclusion 79
CHAPTER 5 80
5.1 Summary of The Project 80
5.2 Project Contribution 80
5.3 Project Limitations 81
5.4 Recommendations 82
5.5 Conclusion 82
REFERENCES 83
APPENDIX A: INTERVIEW QUESTIONS 85

ACKNOWLEDGEMENT

Alhamdulillah, I praise and thank ALLAH S.W.T, the Almighty, for giving me this opportunity, the determination, and the strength to finish this research within the required time. First and foremost, I would like to offer my sincere gratitude and special big thanks to my supervisor, Miss Fazlin Marini Binti Hussain, for her guidance, invaluable help, and constant encouragement to complete this research.

I would like to express my special thanks to Madam Siti Nurul Hayatie Binti Ishak, my lecturer for CSP650, because of her knowledge and guidance among the students in preparing and completing this research.

Thus, I could not have completed this research without the support of my beloved friends and family members. Their continuous encouragement, prayers and support for not letting me give up have helped me a lot throughout the process. Special thanks to my friends for their help and opinions in preparing this research.

Finally, I want to thank me for believing in me, I want to thank me for doing all this hard work. I want to thank me for having no days off. I want to thank me for never quitting. I want to thank me for always being a giver and trying to give more than I receive. I want to thank me for trying to do more right than wrong. I want to thank me for always being me.

ABSTRACT

Mathematics is often considered to be one of the hardest subjects of learning since most of the students in Malaysia find it hard to understand the concepts and solve problems, not to mention memorizing formulas which effect on their confidence and their grades. This project has come up with SPMVisionMath, an interactive courseware created to assist students in getting ready for the SPM Mathematics examination. Videos, quizzes, notes, and interactive learning games are added to the courseware to encourage learning and improve student's comprehension. It was designed according to Gagne's Nine Events of Instruction framework and the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation) with the added Analyze Knowledge phase so that effective learning results can be assured. Functionality testing was done to check the functionality of the system, and a user evaluation was done by thirty-four (34) respondents through the System Usability Scale (SUS) that provided a SUS score of 72.13, which is good usability and moderate user satisfaction. The results show that SPMVisionMath allows students to learn at their pace, enhances understanding and problem-solving, and helps students to memorize important concepts of Mathematics and SPM preparation.