

**IMPLEMENTATION OF INTERACTIVE EBOOK FOR STPM GENERAL
STUDIES TOPIC**



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

IMPLEMENTATION OF INTERACTIVE EBOOK FOR STPM GENERAL
STUDIES TOPIC

IZZAH SHAIRAH BINTI KHAIRUDDIN



This report is submitted in partial fulfillment of the requirements for the
Bachelor of Computer Science (Interactive Media) with Honours.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
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2021

DECLARATION


I hereby declare that this project report entitled
**IMPLEMENTATION OF INTERACTIVE EBOOK FOR STPM GENERAL
STUDIES TOPIC**

is written by me and is my own effort and that no part has been plagiarized
without citations.

STUDENT :  _____ Date : 6 September 2021
IZZAH SHAIRAH BINTI KHAIRUDDIN



I hereby declare that I have read this project report and found
this project report is sufficient in term of the scope and quality for the award of
Bachelor of [Computer Science(Interactive Media)] with Honours.

SUPERVISOR :  _____ Date : 6 September 2021
TS AHMAD SHAARIZAN BIN SHAARANI

DEDICATION

I dedicate this report to my beloved parents. My parents have always been there for me when I was on the edge of giving up. They provide me with education access that helps me reach my current level successfully and never stop supporting my studies.



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I want to convey my most tremendous thankfulness to Allah SWT for the process for me to complete this project. I won't be able to finish my endeavour without Allah blessings.

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This acknowledgement would not be complete if I did not express my gratitude towards my adored parents and family. They have provided me with unwavering moral support since the first day of my project. Through their help and advice, I managed to turn this project into success with an eased heart.

Finally, I would like to express my appreciation to my cherished friends. They never give up on making me feel motivated and helping me turn this project into a successful project.

Thank you.

ABSTRACT

Interactive eBook for STPM General Studies Topic is an interactive eBook developed for all STPM students, regardless of their chosen stream, as the subject is a compulsory subject. This interactive eBook was designed to help the students in their learning process and help teachers use the interactive eBook as their teaching material. The most common students' popular viewpoints on the subject are difficult to comprehend, and there is a lack of multimedia material to aid their comprehension of the subject. Therefore, the project's goals of exploring the aspects and requirements and developing an interactive eBook for the General Studies subject were also met. This interactive eBook also assesses students' perceptions on using the interactive eBook as a learning tool for General Studies subject. This eBook provides interactive features such as interactive graphics, video, audio, gallery, and quiz, which help students increase their understanding of the subject. This interactive eBook only covers for semester two syllabus. The platform used for the development of this eBook is Adobe InDesign from Adobe. Adobe InDesign can produce a variety of features, elements, and requirements for interactive eBooks. The ADDIE model is used for the project methodology. The project methodology is done by planning the projects thoroughly and executes through the phases set to complete the project. The analysis of the project is done by making a comparison of the project with the existing project. The expected outcome of the study is that improvements can be analysed and applied to develop the project. Thus, modifications were added for a better result of the eBook during the final stage. The project progressed smoothly, and all of the project's objectives were met. This interactive eBook has the potential to be a new platform for making learning and teaching more fun.

ABSTRAK

eBuku Interaktif untuk STPM Pengajian Am Topik adalah eBuku interaktif yang dibangunkan untuk semua pelajar STPM, tanpa mengira aliran pilihan mereka, kerana subjeknya adalah subjek wajib. eBuku interaktif ini direka untuk membantu pelajar dalam proses pembelajaran mereka dan membantu guru menggunakan eBuku interaktif sebagai bahan pengajaran mereka. Sudut pandangan pelajar yang paling umum mengenai subjek adalah ia sukar difahami, dan terdapat kekurangan bahan multimedia untuk membantu pemahaman mereka mengenai subjek tersebut. Oleh itu, matlamat projek untuk meneroka aspek dan keperluan dan membangunkan eBuku interaktif untuk subjek Pengajian Am juga tercapai. eBuku interaktif ini juga menilai persepsi pelajar terhadap penggunaan eBuku interaktif sebagai alat pembelajaran dalam subjek Pengajian Am. eBuku interaktif ini menyediakan ciri-ciri interaktif seperti grafik, video, audio, galeri, dan kuiz interaktif, yang membantu pelajar meningkatkan pemahaman mereka mengenai subjek. eBuku interaktif ini hanya merangkumi sukatan pelajaran bagi semester dua. Platform yang digunakan untuk pengembangan eBook ini adalah Adobe InDesign dari Adobe. Adobe InDesign dapat menghasilkan pelbagai ciri, elemen, dan keperluan untuk eBuku interaktif. Model ADDIE digunakan untuk metodologi projek. Metodologi projek dilakukan dengan merancang projek secara menyeluruh dan dilaksanakan melalui fasa yang ditetapkan untuk menyelesaikan projek. Analisis projek dilakukan dengan membuat perbandingan projek dengan projek yang ada. Hasil kajian yang diharapkan adalah bahawa penambahbaikan dapat dianalisis dan diterapkan untuk mengembangkan projek. Oleh itu, pengubahsuaian ditambahkan untuk hasil yang lebih baik semasa peringkat akhir. Projek ini berjalan lancar, dan semua objektif projek tercapai. eBuku interaktif ini berpotensi menjadi platform baru untuk menjadikan pembelajaran dan pengajaran lebih menyeronokkan.

TABLE OF CONTENTS

	PAGE
DECLARATION	II
DEDICATION	III
ACKNOWLEDGEMENTS	IV
ABSTRACT	V
ABSTRAK.....	VI
TABLE OF CONTENTS.....	VII
LIST OF TABLES	XII
LIST OF FIGURES	XIII
LIST OF ABBREVIATIONS	XIV
CHAPTER 1: INTRODUCTION.....	1
1.1 Introduction.....	1
1.2 Problem Statement.....	2
1.3 Objective.....	3
1.4 Scope of the Project.....	3
1.5 Project Significant.....	4
1.6 Conclusion	4
CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY ..	5
2.1 Introduction.....	5
2.2 Domain	5
2.3 Existing System.....	7

2.3.1	<i>Ace Ahead Teks STPM Pengajian Am Semester 2 Edisi Keempat...</i>	8
2.3.2	<i>Nota Ringkas STPM Pengajian Am Penggal 2</i>	9
2.3.3	<i>eBook Subscribe Online:Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)</i>	10
2.3.4	Comparison of Existing System.....	11
2.4	Project Methodology	12
2.4.1	Instructional Design.....	15
2.4.1.1	Educational Goals.....	15
2.4.1.2	Course Map/Flowchart	15
2.4.1.3	Detailed Course Content	16
2.4.1.4	Test Questions	18
2.4.1.5	Metaphor	19
2.5	Project Requirements	20
2.5.1	Comparison Between Software	20
2.5.2	Software Requirement	21
2.5.3	Hardware Requirements	22
2.6	Conclusion	23
CHAPTER 3: ANALYSIS.....		24
3.1	Introduction.....	24
3.2	Current Scenario Analysis	24
3.3	Requirement Analysis	25
3.3.1	Project Requirement	25
3.3.1.1	Need Analysis	25
3.3.1.2	User Analysis	26

3.3.1.3	Technical Analysis	26
3.3.1.4	Resource Analysis	26
3.3.1.5	Requirement Gathering.....	26
3.3.2	Software Requirement	27
3.3.3	Hardware Requirement.....	28
3.4	Project Schedule and Milestone.....	28
3.5	Conclusion	31
CHAPTER 4: DESIGN.....		32
4.1	Introduction.....	32
4.2	System Architecture	32
4.3	Preliminary Design.....	33
4.3.1	Storyboard Design	34
4.4	User Interface Design.....	34
4.4.1	Navigation Design	38
4.5	Conclusion	39
CHAPTER 5: IMPLEMENTATION.....		40
5.1	Introduction.....	40
5.2	Media Creation.....	40
5.2.1	Production of Texts	40
5.2.2	Production of Graphics	42
5.2.3	Production of Audio	45
5.2.4	Production of Video.....	46
5.3	Media Integration	48
5.4	Product Configuration Management	49

5.4.1	Configuration Environment Setup.....	49
5.5	Implementation Status.....	51
5.6	Conclusion	52
CHAPTER 6: TESTING		53
6.1	Introduction.....	53
6.2	Test Plan	53
6.2.1	Test User	54
6.2.2	Test Environment	54
6.2.3	Test Schedule	55
6.3	Test Strategy	56
6.4	Test Implementation.....	57
6.4.1	Test Description	57
6.4.2	Test Data.....	57
6.4.2.1	Experts' Tester	58
6.4.2.2	Target user's Tester	61
6.5	Test Results and Analysis.....	63
6.5.1	Testing Result Questionnaire for Expert's Testing	63
6.5.2	Testing Result Questionnaire for Target User Testing	67
6.6	Conclusion	71
CHAPTER 7: CONCLUSION		72
7.1	Introduction.....	72
7.2	Observation on Weakness and Strengths	72
7.3	Propositions for Improvement	73
7.4	Project Contribution.....	74

7.5	Conclusion	74
	REFERENCES	75
	APPENDIX A: INTERFACE DESIGN	77
	APPENDIX B: SETUP CONFIGURATION.....	80
	APPENDIX C: QUESTIONNAIRE FOR TESTING PHASE.....	85
	APPENDIX D: TURNITIN REPORT	102



LIST OF TABLES

	PAGE
Table 2.1 Comparison of the Existing Project	11
Table 2.2 Comparison Between Software	20
Table 3.1 Software for the Project	27
Table 3.2 Hardware for the Project	28
Table 3.3 Gantt Chart of the Project Activities	29
Table 3.4 Milestone of the Project Activities.....	30
Table 5.1 Details of the Text Created for the eBook.....	42
Table 5.2 Details of Graphic Created.....	43
Table 5.3 Details of Audio Production	46
Table 5.4 Details of Video Production.....	48
Table 5.5 Implementation Status.....	51
Table 6.1 Testing Schedule	55
Table 6.2 Section A: General Information.....	58
Table 6.3 Section B: Functionality of eBook.....	59
Table 6.4 Section C: Comments or Suggestions for Improvement	60
Table 6.5 Section A: General Information.....	61
Table 6.6 Section B: Functionality of eBook.....	62
Table 6.7 Section C: Comments or Suggestions for Improvement	63

LIST OF FIGURES

	PAGE
Figure 2.1 Front Cover Book of <i>Ace Ahead Teks STPM Pengajian Am Semester 2 Edisi Keempat</i>	8
Figure 2.2 The First Page of <i>Nota Ringkas STPM Pengajian Am Penggal 2</i>	9
Figure 2.3 Front Cover of eBook <i>Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)</i>	10
Figure 4.1 System Architecture.....	33
Figure 4.2 Storyboard Design.....	34
Figure 4.3 eBook Main Interface.....	35
Figure 4.4 Table of Content.....	35
Figure 4.5 The Title Page for Each Topic	36
Figure 4.6 The Content/Learning Interface.....	37
Figure 4.7 Quiz Interface.....	37
Figure 4.8 Past Year Questions	38
Figure 4.9 Navigation Design.....	39
Figure 5.1 Process for Text Creation	41
Figure 5.2 Process for Graphic Creation	43
Figure 5.3 Process for the Audio Production	45
Figure 5.4 Process of Video Production	47
Figure 6.1 Insight of Effectiveness of eBook	64
Figure 6.2 Insight of the Usability	65
Figure 6.3 Insight of the Design.....	66
Figure 6.4 Insight of the Usability	68
Figure 6.5 Insight of the Design.....	69
Figure 6.6 Insight of the Learnability	70

LIST OF ABBREVIATIONS

STPM	-	Sijil Tinggi Pelajaran Malaysia
SPM	-	Sijil Pelajaran Malaysia
ADDIE	-	Analysis, Design, Develop, Implement, Evaluate
EPUB	-	Electronic Publication



CHAPTER 1: INTRODUCTION

1.1 Introduction

In this era, with the speedy growth of technology, online learning has started to be implemented as part of the learning method in a particular school. However, most schools are still using the traditional book, and only a tiny amount of the eBook is implemented there. Hence, digital eBooks should be implemented in the school to advance parallel with the advancement of the current technology.

The eBook helps bring a refreshing and enjoyable learning method. As eBooks can be viewed in the form of an interactive book, many students find using the eBook helps them focus on the subject. The eBook may differ from the typical traditional book as the eBook contains various types of multimedia features. An eBook can provide videos, graphics, audio, animation, and an interactive pop quiz to help the students learn more interactively. The usage of multimedia elements helps in creating a more effective way of knowing for the interactive book. Based on the previous study by Roberts (2018), images promote greater engagement and comprehension than text alone. The findings also back up the theory that using appropriate visuals in combination with less text boosts students' engagement and comprehension of an academic subject. Thus, this eBook has much better potential for the students to enjoy the learning process and focus on rather than the traditional book.

The *Sijil Tinggi Persekolahan Malaysia* (commonly known as the Malaysian Higher School Certificate or STPM) is a one of the many possibilities available programme after the completion of SPM. SPM or also known as the *Sijil Pelajaran Malaysia* is a national test for all form 5 students in Malaysian government schools that follow the education pathway. General Studies (also referred to as *Pengajian Am*) is a compulsory

subject for all STPM students. This subject is also known as one of the most challenging subjects as the subject required the ability to think critically, creatively, and innovatively. The goal of General Studies is to generate students who are mature-minded, skilled, moral, and able to contribute to their own well-being and the well-being of the nation. Students can apply awareness of human experience and the environment through this subject, including one's heritage. In addition, the subject also could cultivate a sense of love for the country, responsibility for oneself, others, community, society, and respect for other cultures and societies.

The eBook of the subject is a restorative material and tool both for the teachers and the students. The eBook will be able to ease the process of teaching and learning. Through the eBook, the average lesson turn into an enjoyable task during the class session. The eBook also will be helpful for the students to review when preparing for the examination in a more fun way. Therefore, an eBook will be an excellent alternative to bring a new experience of studying a tricky subject to become a more delightful experience.

1.2 Problem Statement

Nowadays, all information can be found easily through the internet. Despite the ease of finding information, the multimedia materials for General Studies subject were quite rare and hard to find. As the General Studies subject is compulsory, some students think the General Studies subject needs a more interactive eBook that helps better understand the issue.

The students' popular viewpoint on the subject is difficult to comprehend as the subject is very complex. Besides that, due to lack of interactive eBooks affects their comprehension of the subject. All of this shows that an interactive eBook for STPM students for General Studies will help to assist STPM students' learning process.

Apart from that, the subjects tend to have more text rather than visuals. Due to that, the issue is always deemed uninteresting by certain students, especially those who dislike reading. However, through an interactive eBook, the students will overcome the stigma and see the subject better.

1.3 Objective

This project pursues the following objectives:

1. To explore the elements and requirements for interactive eBook development.
2. To develop an interactive eBook for the General Studies subject.
3. To evaluate the perception of the students towards using the interactive eBook as a learning tool in the General Studies subject

1.4 Scope of the Project

This project is developed for STPM students and teachers to help them enhance the learning and teaching process for the General Studies subject for semester two. The eBook contains various interactions and features that help the students understand the subject deeper. Due to this, the students could increase their knowledge and shorten valuable information to help them understand the subject more simply. Moreover, the eBook can also help the teacher convey the syllabus more interactively, attracting the students to learn in a fun way.

STPM students have overall three semesters for their studies. This project only includes the syllabus of General Studies for semester two. The syllabus includes two main topics which is *Alih Bentuk Komunikasi* and *Malaysia, Maju Dan Sejahtera*. As for the first topic, *Alih Bentuk Komunikasi*, the topic focuses on the know-how to draw graphs. While for the second topic, *Malaysia Maju Dan Sejahtera* covers the importance of progressive Malaysia in multiple sectors. The project provides interactive notes and tips for each chapter. Furthermore, the eBook also offers few examples of the past-year questions to help the students get used to the examination format in an enjoyable manner. The past year questions were taken from the book called *Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)* published by the Local Publications (M). The past year questions provided from the book can be used and referred as for the development of the project. There are also some animated videos provided that tell the learning outcomes for each topic. The eBook also includes few quiz questions by the end of each topic.

1.5 Project Significant

The project's significance is developing an eBook for the STPM General Studies Topic for semester two. Additional interactions enhanced the appeal of the existing physical learning book through this eBook. The eBook helps the students grasp the content of the General Studies subject through the multimedia elements shown in the interactive eBook. The usage of interactive graphics, videos, audio, interactive quiz, and other features attract the viewers' attention and keep them focused when using the eBook.

The project aimed to help the students improve their knowledge and ease the teachers in delivering the subject's content. The project's expected outcome is that the students and teachers can use the eBook for their learning and teaching process. Through the interactive eBook usage, the students and teachers can have a fun and relaxing method to learn and teach. Plus, the eBook can be accessed at any time and from any location.

1.6 Conclusion

The chapter explains the eBook overview for the General Studies subject. As digital devices are the norm nowadays, this eBook will be beneficial and easy to access both for the students and the teachers. From the problem statement until the project significance, all the information and the details have been stated. The problem statement shares the concerns of the students regarding their understanding of the subject.

At the same time, the objectives explain the main aims of the project that needs to deliver. Next, the scope talks about the target users of the eBook. Then, the project significance brief about the benefits that will be gain throughout the eBook. Lastly, these promising eBook results are helpful and enjoyable to use regardless of the user and time.

The next chapter explained the literature review of the project. The chapter also presented the details about the project methodology used for the project and the existing system was compared with the project to identify the differences and changes are made that improved the development of the interactive eBook.

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

The primary purpose of this chapter is the explanation of the literature review and the project methodology. In addition, there was a comparison and observation between this project and the existing project. Furthermore, a few details are pointed out about the current project and this project. All data were compiled from multiple sources such as a journal to prove the literature review in this chapter.

The methods that have been applied in the development of the project were also explained. Also, there is an explanation of the software and hardware requirement that have been used for the eBook.

2.2 Domain

Form Six is the educational avenue for SPM school leavers to grow talent and innovation to become a generation that will significantly affect both inside and outside of Malaysia. The new STPM assessment framework included a total of twenty-two subjects. However, students could only choose four or five subjects, one of which was General Studies, also known as *Pengajian Am*, which is compulsory to be taken by every student. Since this subject is essential and compulsory to pass the examination, the students need to be diligent in reading. Although many STPM General Studies reference books can be purchased in bookstores, general knowledge greatly influences student achievement in the STPM examination.

Due to that, eBook is developed to create learning and teaching materials packed with multimedia elements. This project aims to eliminate the barrier between the users and the stigma of books. This eBook can become an inventive outturn as the interactive eBook allows users to read the eBook and interact as preferred. This project enforced a new way of creating an eBook packed with information and enjoyable compared to the traditional book.

In the long run, Harman (2018) argues that there are nine benefits of interactive eBooks. Firstly, interactive eBooks have better engagement compared to the physical books. By incorporating technologies, the user can use interactive content such as images, audio, and video, resulting in higher levels of engagement with the content. Secondly, interactive eBooks can easily be upgraded. Unlike paper books, interactive eBooks can be upgraded with minimal effort whenever necessary and make the eBook simple to incorporate multimedia into the content. Thirdly, interactive eBooks have better retention. Traditional learning approaches are limited to physical books. These approaches lack interactivity, limiting them to only reading and learning when necessary. On the other hand, interactive eBooks enables a user to incorporate technology for retention and contextual learning.

As the fourth benefit, interactive eBooks could create a collaboration between professors and students. Some digital publishing platforms allow professors and students to collaborate directly through the eBooks themselves. When students have difficulties understanding concepts, the students can highlight and make a comment on the eBook, which the professor can address the issues afterwards. Fifthly, interactive eBooks have better accessibility compared to the physical book. Interactive eBooks available on various devices, including mobile phones, e-readers, and computers. Sixthly, an eBook is also a contextual and realistic learning experience. Integration of multimedia into interactive eBooks can make the content more contextually meaningful and easier to relate to. Students can learn by watching various multimedia features thanks to the integration of technology. All of this enhances the learning experience by adding a layer of knowledge over facts.

The cost-effectiveness of possessing an eBook is the seventh benefit. Putting out a physical book is a costly endeavour. The quantity and quality of the paper have a significant impact on the cost. On the other hand, creating an eBook is more cost-effective because it reduces all these costs and can update the material without reprinting. The interactive eBook moreover, has numerous use cases. The eighth advantage of using interactive eBooks is that the interactive eBooks may be used in a variety of applications. Interactive eBooks have a wide range of applications due to the interactive eBook's ability to increase interaction. Finally, the interactive eBooks may provide the assessment and quizzes. The students may use the interactive eBook to answer quizzes using the functionality provided in the eBook.

2.3 Existing System

The main objective of the project is to develop an eBook for the General Studies subject. Therefore, a comparison between multiple projects is needed to recognise the strength and weaknesses of each of them. The three projects which are similar to this project are: (i) *Ace Ahead Teks STPM Pengajian Am Semester 2 Edisi Keempat*, (ii) *Nota Ringkas STPM Pengajian Am Penggal 2* and (iii) *eBook Subscribe Online: Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)*. This stage helped improve the missing part in developing the eBook. Furthermore, the platform for the eBook plays a vital aspect in attracting users. Thus, the existing content was analysed in this project to gain an outline for developing the project.

2.3.1 *Ace Ahead Teks STPM Pengajian Am Semester 2 Edisi Keempat*

The first similar content with the project is *Ace Ahead Teks STPM Pengajian Am Semester 2 Edisi Keempat*. This book is a physical book that needs to be purchased to use the book. This book provides detailed notes of the subject throughout every chapter. The book also includes sample questions that can help the students to understand the exam scheme of the General Studies subject. The publisher of this book has published three editions before this. This book is the latest edition of the book based on the newest scheme of the subject.

Figure 2.1 below shows the front cover of the traditional reference book of the General Studies subject. The content of this book are mind maps notes, infographics and the text were arranged in point form. Regarding the exercises, the publisher provides a space to fill in answers at the side of the notes related to the chapter. The publisher also includes clones' questions that resemble the actual format of the STPM examination and the model of the questions paper.

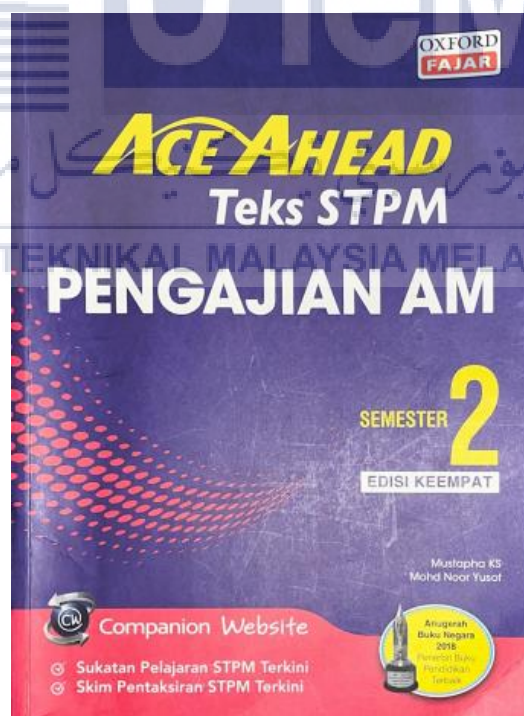


Figure 2.1 Front Cover Book of *Ace Ahead Teks STPM Pengajian Am Semester 2 Edisi Keempat*

(Source: Oxford Fajar)

2.3.2 *Nota Ringkas STPM Pengajian Am Penggal 2*

The second source that is similar to this project is the *Nota Ringkas STPM Pengajian Am Penggal 2*. This content is a PDF file that can be download from the internet freely. The creator of the notes uploaded the PDF file on an online platform. This note is concise and very straightforward as the notes only shares the important details of every chapter.

Figure 2.2 shows the first page of *Nota Ringkas STPM Pengajian Am Penggal 2*. The content contains mind maps, notes, and infographics. These notes also used some graphics and text. There are no questions that were provided in the PDF file. The design of the content is entirely out of place as this project used colours that don't match one another.



Figure 2.2 The First Page of *Nota Ringkas STPM Pengajian Am Penggal 2*

(Source: <https://123dok.com/document/zxxo6doz-nota-ringkas-stpm-pengajian-am-penggal.html>)

2.3.3 eBook Subscribe Online: *Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)*

The third content that is similar with the project is the eBook *Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)*. This eBook is an online eBook that needs to be subscribed. The eBook is a non-interactive electronic book. This eBook is a PDF scanned version of the book's physical book with the same title and publisher.

Based on Figure 2.3, shows the front cover of eBook *Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)*. The content of this eBook is the model of the questions paper of the STPM examination. In terms of the exercises, a space was provided for the students to fill in the answers. However, there are no notes provided in the book.



Figure 2.3 Front Cover of eBook *Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)*

(Source: Local Publications (M) SDN BHD)

2.3.4 Comparison of Existing System

The aim of comparing existing projects is to see if there are variations in terms of interactivity, interactive elements, and overall usefulness. The Table 2.1 below shows four types of projects, including the current project and the existing project. The comparison details are the target user, the platform, price, the multimedia element provided in the existing project, language, strength, and weakness.

Table 2.1 Comparison of the Existing Project

Existing Book	Ace Ahead Teks STPM Pengajian Am Semester 2 Edisi Keempat	Nota Ringkas STPM Pengajian Am Penggal 2	eBook Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)	Interactive EBook for STPM General Studies Topic
Target User	STPM students	STPM students	STPM students	STPM students
Platform	Traditional Book	PDF	eBook	Interactive eBook
Price	Paid	Free	Paid	Free
Multimedia Component	Graphic and text	Graphic and text	Graphic and text	Graphic, video, audio, and text
Language	Malay	Malay	Malay	Malay
Strength	Have notes, sample questions and	Can be download and view on	Can be used on all devices	Interactive, contain multiple

	companion website	all type of devices		multimedia features and is easy to use on any devices
Weakness	A traditional book and not interactive	The design is outdated and doesn't have audio nor video	Only provide sample questions in a scanned method	Need a digital device to use the interactive eBook

2.4 Project Methodology

There are a few methodologies that can be used for the development of the project. All of this depends on the functions and elements that wanted to be applied in the project. Various models for systemic design have been suggested. Still, the most appropriate is the ADDIE model, a widely used approach that requires a lot of preparation.

For this eBook, the ADDIE model has been chosen as the methodology for developing the project. In the past, instructional designers and training developers used the ADDIE model as a generic strategy. Analyse, Design, Develop, Implement, and Evaluate are the five steps that make up a dynamic and adaptive framework for creating a successful project. This model is commonly used by instructional designers and training developers.

Based on Figure 2.4 below, ADDIE model processes are shown. The first process for the development is the analysis phase. A list of all the details and required resources such as the project's background, problem statement, the software and the hardware were listed out. A walkthrough also was done to fully comprehend the project objectives and the target audience. The project's problem statement was identified in this phase. The problem statements are the subject is difficult to comprehend as the subject is very complex and lack of multimedia materials for the subject. Most of the materials available are only text-based and lack of multimedia elements in the

contents. Thus, the project objectives were decided, which is to explore the elements and requirements for interactive eBook development, develop the interactive eBook for the General Studies subject and evaluate the perception of the students towards using the interactive eBook as a learning tool in the General Studies subject. A brainstorming session with the teacher who teaches General Studies is done to identify the contents for the interactive eBook. The contents chosen for the interactive eBook was the topics for semester two which consists of two topics and few examples of the past year questions. The target audience chosen for this project is the semester two form six students. The EPUB file is chosen as the delivery options of the eBook. The EPUB file was created using Adobe InDesign and can be viewed using the Books, Kotobee reader or any EPUB reader.

The second process is the design phase. In this phase, the instructional strategies were prepared to keep track of all the details. The details are the theme colours for the design, the capacity of design to fit into each page, the usage of the multimedia elements in the project and the content for each topic. All the objectives for the design were jot down, and a record of the designs is kept. The design phase starts with creating the storyboard for the eBook after determined the theme and the concept. The storyboard had been sketched to make the design process simpler. In this phase, the graphics, videos, and audio needed were compiled to implement the materials in the eBook. The type of the self-reviewed quiz used for the interactive eBook is also determined which are the multiple-choice questions and the true-false questions.

The third process for the ADDIE model was the develop phase. For the develop phase, the project is built per the specification that have been listed out previously. The project's development has been done through the analysis and design process by closely following the plan made to ensure the product runs well. In this phase, the materials gathered during the analysis and design phase been assembled in the Adobe InDesign. As for the video creation, Adobe Premiere Pro and Adobe After Effects, are used which includes the recording, editing, and producing for the learning outcomes of each chapter. Furthermore, audio is recorded and edited with Audacity to remove any flaws. Furthermore, the colour palette used in this project are white, dark blue,

light blue, and yellow. As for the font, Montserrat Family font is chosen as the font for the interactive eBook.

For the fourth phase, which is implement, this phase confirms whether everything meets the specifications. The target user, multimedia experts, and teachers engaged in a hands-on demonstration of how to use the interactive eBook during the implementation phase. The testers can test the eBook on smartphone or laptop to see how well the interactive eBook performs. When any deficiency was found, all of the deficiencies is recorded to keep track of the project development progress.

The final process for the project is evaluate process. In this process, any problem addressed is taken care of to avoid any hindrance to the project. The target users review this eBook using Google Forms for questionnaires after testing the interactive eBook. Next, based on the testers' feedback, certain changes or fixes are made to avoid repeating the same mistakes. Thus, all of the processes need to be done so that the project's development runs smoothly.

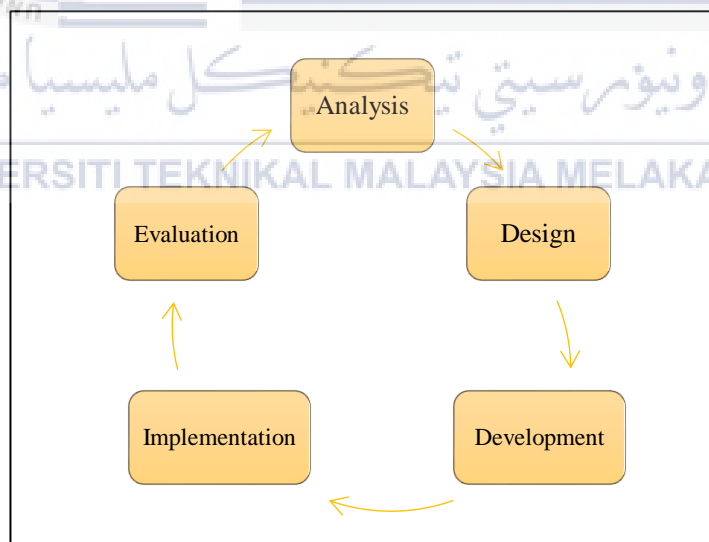


Figure 2.4 ADDIE Model

2.4.1 Instructional Design

Instructional design can be defined as the construction of learning experiences and resources in such a way that knowledge and skills are acquired and applied. Instructional design integrates ideas on how individuals learn and how to provide information in the most effective way.

2.4.1.1 Educational Goals

The primary purpose of this eBook is to apply the content of the Interactive eBook for STPM General Studies Topic by the students. Furthermore, teachers can use the eBook as their teaching tool rather than the traditional book. Through the eBook, the students will spark their interest in learning the topic.

2.4.1.2 Course Map/Flowchart

Figure 2.5 shows the flow of this eBook from the start until the end. The eBook starts with the cover page of the eBook and follows with the table of content for the eBook. After that, the user may choose the topic they wish to proceed and the outline of the topic was shown to the user. Next, the user may see the content of the topic and answer some quizzes once the user reach to the end of the topic. Before the user end their experience using the eBook, the user may use the examples of the past year questions.

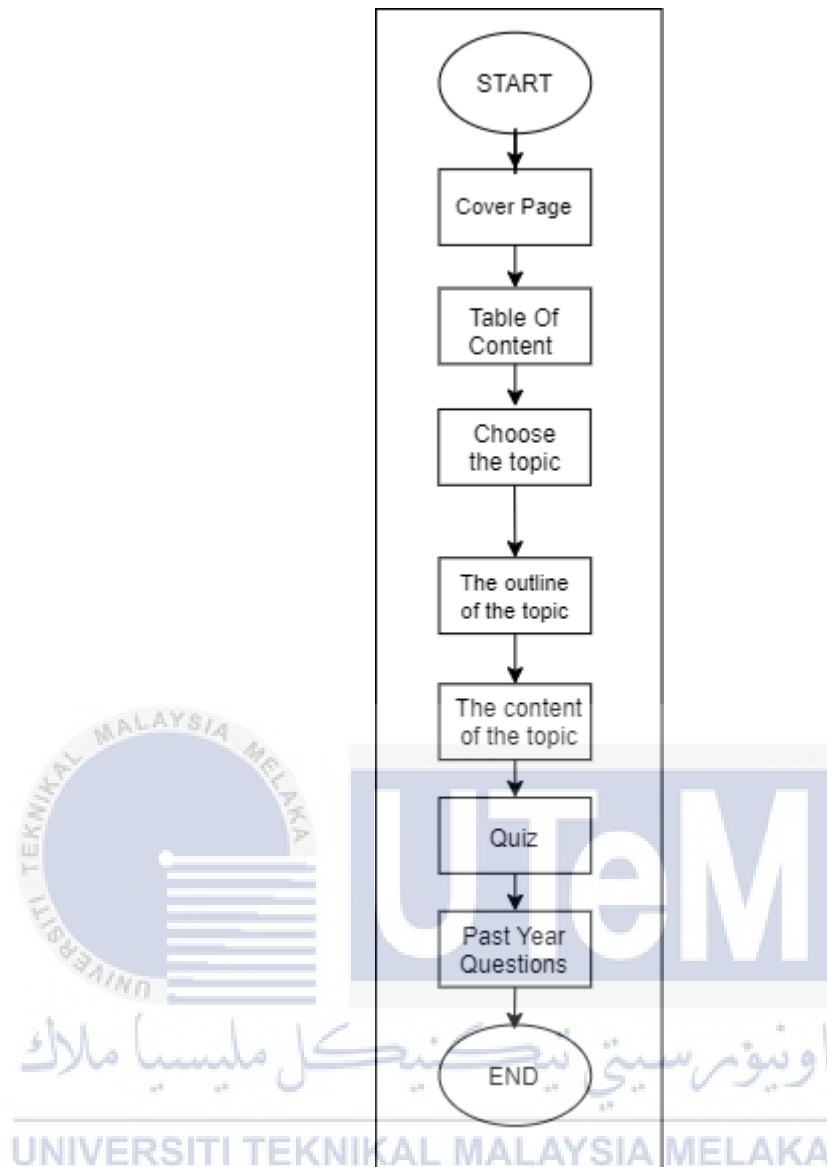


Figure 2.5 Flowchart of the eBook

2.4.1.3 Detailed Course Content

The detailed content for each topic of this interactive eBook is explained in this stage. The choice of topics, as well as the structuring and sequencing of content, are referred to as course content. The eBook content contained two topics. The first topic is *Alih Bentuk Komunikasi* and the second topic is *Malaysia Maju Dan Sejahtera*.

i. Topic 1

Figure 2.6 below shows the detailed content for topic one which is *Alih Bentuk Komunikasi*. For the first topic, there are ten subtopics covered in the eBook. The subtopics are: (i) *Graf Bar Kompaun*, (ii) *Graf Bar Komponen*, (iii) *Graf Bar Memesong*, (iv) *Graf Bar Piramid*, (v) *Graf Garis Kompaun*, (vi) *Graf Garis Komponen*, (vii) *Graf Garis Memesong*, (viii) *Graf Gabungan*, (ix) *Carta Pai Berbanding*, and (x) *Carta Pai Bertingkat*.



Figure 2.6 Alih Bentuk Komunikasi

ii. Topic 2

Figure 2.7 shows below shows the detailed content for topic two which is *Malaysia Maju Dan Sejahtera*. For the second topic, there are seven subtopics covered in the eBook. The subtopics are: (i) *Agama Dan Kepercayaan*, (ii) *Ekonomi*, (iii) *Politik*, (iv) *Prasarana*, (v) *Sosial Dan Budaya*, (vi) *Ekologi*, and (vii) *Sains Dan Teknologi*.

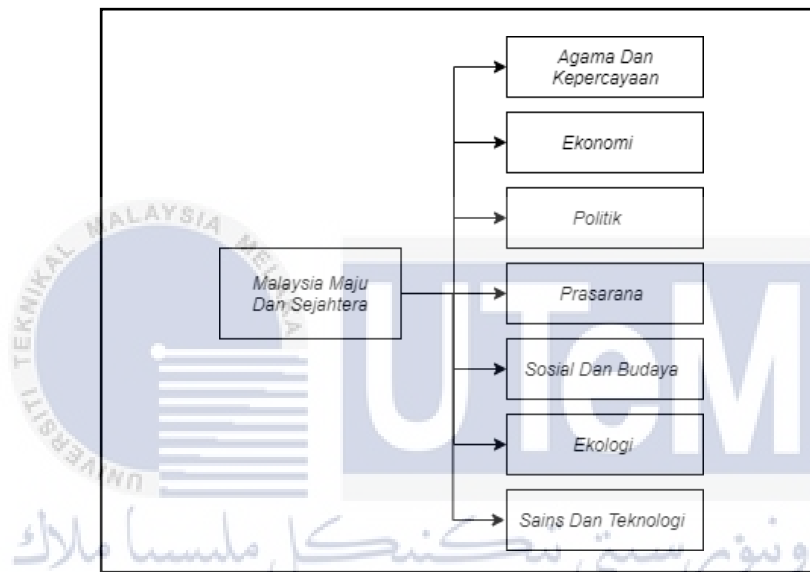


Figure 2.7 *Malaysia Maju Sejahtera*

2.4.1.4 Test Questions

For this project, two types of self-reviewed questions were selected which were multiple-choice questions and true-false type of questions. Multiple-choice questions are preferred because the multiple-choice questions are fun and help assist students in recalling the answer. True-false questions are chosen because they are easy to score. Students can remember important information and learn the information faster through these types of questions.

If the student selects the correct answer, a tick will appear, and the student may move on to the next question or the next topic. If the student selects the incorrect answer, the inaccurate cross will show.

2.4.1.5 Metaphor

The concept of this interactive eBook is minimalist. The minimalist concept was chosen because minimalism concept strives for objectivity and simplicity. The more aspects a design has, the more flaws and distractions the design for the eBook might accumulate, and the less usable the eBook becomes to the user. Minimalistic themes improve communication and user experiences by reducing unneeded components or information. With the minimalist concept, only specific colours are being used for the project development.

The colours that have been used for the eBook are white, dark blue, light blue, and yellow. The point made by Lundberg (2018) is white creates a simple vibe when applied in design. White can also be a straightforward, clean, and modern colour. White is also the most neutral of all the hues, and often used as a base for other, more dynamic colours. For blue colour, blue is a tranquil and serene colour that symbolises knowledge and responsibility. Blue is also a soothing and peaceful colour. Dark blue can connote depth and force, while light blue can connote tranquilly. The blue colour is the most popular hue in the world, both in terms of personal preferences and in terms of design. As for the yellow colour, yellow is a cheerful, youthful colour that evokes feelings of hope and optimism. Yellow attracts people's attention as well. For yellow, the colour is used because yellow works fantastic with blue as yellow can lighten up a dark design immensely. All of the colours picked contribute to the eBook's design becoming user-friendly and appealing.

2.5 Project Requirements

There are two project requirements which are software and hardware requirements for eBook development. The requirements are list out as shown below.

2.5.1 Comparison Between Software

The comparison between software was made to identify each software specialities to choose for the most suitable for the project's development. The leading software of the comparison is chosen from the uses of the software, compatibility, and the price of each software.

Table 2.2 Comparison Between Software

Software	Kotobee	Pages	Adobe InDesign
Uses	Create interactive content, eBooks and can be export in various types formats	Create documents, books, eBooks through Apple devices	Create digital page layout design or printed design such as flyers, brochures, magazines, books, and eBooks
Compatible	Windows and iOS	iOS	Windows and iOS
Price	RM 1,265.80 (Premium and lifetime use for one user)	Free only for Apple devices	RM 116.53 monthly

From the comparison from the table above, Adobe InDesign 2021 is the best software that can be used for project development.

2.5.2 Software Requirement

The leading software that is required for the development of the project is Adobe InDesign 2021. Adobe InDesign 2021 is a desktop publishing and page layout design software commonly be used to create posters, flyers, brochures, magazines, newspapers, presentations, books, and eBooks. Some of the features of Adobe InDesign 2021 are master pages, automatic page numbers and typesetting.

The following software is Adobe Illustrator CC 2019, which is a vector graphics editor. Adobe Illustrator CC 2019 standard features are vector shapes, typesetting and artboards. This software is commonly used for logo, icons and one-page documents production. The third software needed for the development of the project is Adobe Photoshop CC 2019. This software is commonly used to edit photos and web graphics, create artworks and mockups because Adobe Photoshop CC 2019 is a raster image editor.

For the video production of the project, Adobe Premiere Pro CC 2019 and Adobe After Effects CC 2019 was chosen. As for Adobe Premiere Pro CC 2019, the software is a video editing software that contains multiple features such as the motion graphics template, video transitions, supports numerous video types and more. While, Adobe After Effects is software for creating digital visual effects, motion graphics, and compositing. Audacity has been chosen as the audio editing software required for the development of the project. The software is free to use. Amongst the features of the software, the focus of is live sound can be recorded, multiple audio formats can be edited, and the pitch or the speed of the audio can be changed.

For the documentation of the project, Microsoft Word has been chosen as the software required. Microsoft Word is a word-processing tool known as software that is mainly used to create documents such as reports, letters, assignments and more.

2.5.3 Hardware Requirements

There are three pieces of hardware required for the development of the project. The essential hardware is a personal laptop. Most of the process for the development of the project was done by using a personal laptop. In addition, all the software required for the project was downloaded first-hand to make sure the development process runs smoothly.

The following hardware needed is a smartphone. In this era where everyone carries a smartphone anywhere, the smartphone is also essential for the development of the project. Furthermore, the smartphone is used to test the design and the contents to ensure the compatibility both on laptop and smartphone.

The last hardware for the development of the project is a wireless mouse. A wireless mouse is a type of hardware input device that connects to a computer for the uses of the computer's interface. The use of the wireless mouse helps ease the process for the design editing of the project.

All this hardware is required to ensure that the project development can be done within the time given for the project completion.

2.6 Conclusion

This chapter stated the entire literature review of the project and the literature review's explanation. Besides that, a comparison of the existing system has also been made. A comparison is required to recognise the strengths and shortcomings to improve the areas where eBook development is lacking. Next, the methodology used for the project is the ADDIE model. This methodology is crucial because the methodology offers a tried-and-true way for creating straightforward and successful learning programmes. These details are essential as they are all needed to ensure the development process is done smoothly.

The hardware and software requirement has been used for the project is also being concluded. After comparing software, Adobe InDesign 2021 has been chosen as the most suitable leading software for the project. A few other software has also been used: Adobe Illustrator CC 2019, Adobe Photoshop CC 2019, Adobe Premiere Pro CC 2019, Adobe After Effects CC 2019, Audacity, and Microsoft Word. For the project's development, three pieces of hardware are required. The personal laptop is an essential piece of equipment. The personal notebook was used for the majority of the project development process.

In the next chapter, the approach for creating an eBook is being investigated. The project requirements, software requirements, and hardware requirements are all covered in the next chapter. The chapter also go through the project's timetable and milestones as the project progresses.

CHAPTER 3: ANALYSIS

3.1 Introduction

In this chapter, the method used for eBook development is being analysed. The chapter covers the project requirements, software requirements and hardware requirements. This chapter also covers the project schedule and milestones of the development of the project. The program and milestones are list and described by stages to fully show the progress of the eBook throughout the development.

The main objective of the analysis chapter is to ascertain the elements and features needed for the eBook. This chapter also determines how the eBook has been implemented and how to make them more functional. Thus, the information will be recognised and applied in the eBook.

This chapter also identifies and study the elements and structure based on the interpretation. Furthermore, deciding which aspects are more acceptable and how the features are implemented is a crucial stage. Finally, these specifics are utilised to build a comparison between the sources.

3.2 Current Scenario Analysis

Interactive eBook for STPM General Studies Topic is an eBook utilised in digital devices such as smartphones and tablets. This eBook delivers the information same as the traditional books in an enjoyable manner. Furthermore, the eBook is eye-pleasing and used a minimalist design and fonts that are suitable for reading.

Besides, the eBook also provides a clickable function, making the interactive eBook more interactive as the users can interact with the contents with their preferences. As

an example, the user can watch the learning outcomes video first before starting their lesson. Furthermore, for an extra enjoyable experience, quizzes are also provided for each topic as the quizzes can help the students to refresh their memory regarding the crucial pieces of information. Plus, there are past year questions offered in the eBook.

3.3 Requirement Analysis

The purpose of requirement analysis is to determine the user expectations to create or improve the project. Due to the aim, requirement analysis must be combined to identify specific features, expectations, and development processes.

3.3.1 Project Requirement

This project is under the E-learning content domain. The current drawback faced by the students and teachers is the lack of eBook that helps increase the enjoyable environment during the lessons. Besides, the traditional books of General Studies subject are packed with text and lack multimedia elements. With the help of graphics, videos, and audio materials, it will spark the students' interest in learning the subject using this eBook. The language used is Bahasa Melayu.

3.3.1.1 Need Analysis

The traditional books or online materials available are inert materials. Due to that, the students hard to stay focused and less enjoyable. Thus, this eBook aims to help increase the interest of the students to study.

Once the user opens the eBook, the user sees the main cover of the eBook. The next page of the cover brings the user to the table of content to choose which topic they wish to view. In addition, there are videos of learning outcomes for each topic. The eBook provides the multimedia elements such as text, image, audio, animation, and video, which help students increase their understanding through the interactivity of the content.

3.3.1.2 User Analysis

The objective of this stage is to determine the approach needed for the development of the Interactive eBook STPM General Studies Topic. Interactive features are used to grow the interest of the users. The eBook provides the clickable buttons, audios of the lessons, gallery of images, quizzes that help increase the understanding and the past year questions.

3.3.1.3 Technical Analysis

This eBook is developed using the Adobe InDesign CC 2021. The graphical elements are designed using the Adobe Illustrator CC 2019 and Adobe Photoshop CC 2019. The video in the eBook was created using the Adobe Premiere Pro CC 2019 and Adobe After Effects CC 2019.

3.3.1.4 Resource Analysis

Multiple resources have been used to develop this eBook. For the content sources, the *Modul Pengajaran dan Pembelajaran STPM Pengajian Am, Ace Ahead Teks STPM Pengajian Am Semester 2 (Edisi Keempat)* and *Model Kertas Peperiksaan Pengajian Am STPM Semester 2 (Versi 2020)* were used as references. All the references are physical materials. Most of the graphics are created using Adobe Illustrator CC 2019 and Adobe Photoshop CC 2019. Other resources used were the Unsplash website for the free stock photos used to create a more engaging eBook. The motion graphics were animated using the Adobe After Effects CC 2019 and compiled using the Adobe Premiere Pro CC 2019.

3.3.1.5 Requirement Gathering

Requirement gathering is an essential procedure in the development of the eBook. Through requirement gathering, the project aims can be achieved. Multiple ways were used in gathering the requirements, such as interviewing the students and teachers about the problems they face regarding the subject, seeing, brainstorming, and analysing the documents related to the project. Plus, making the comparison of the existing projects.

3.3.2 Software Requirement

This Interactive eBook for STPM General Studies Topic was developed by using multiple types of software. Proper and suitable software has been decided in the first hand to produce a fantastic outcome. The leading software used is Adobe InDesign CC 2021. This software is commonly used to create and design multimedia materials such as brochures, interactive PDFs, eBooks, books and more.

Then, the graphical materials were created by using the Adobe Illustrator CC 2019 and Adobe Photoshop CC 2019. The materials includes the design of the cover, images of the topics and others. Next, the animated video material in the eBook was made using the Adobe After Effects CC 2019. While the video of the animation was compiled using the Adobe Premiere Pro CC 2019. Audacity was also used to trim and edit the audio of the eBook. Finally, the project also utilises Microsoft Word as the software for the project documentation. All the purposes of each software are explained in Table 3.1 below.

Table 3.1 Software for the Project

No.	Software	Purpose
1.	Adobe InDesign 2021	To create the eBook
2.	Adobe Illustrator CC 2019	To create the graphics material
3.	Adobe Photoshop CC 2019	To create the graphics material
4.	Adobe After Effects CC 2019	To create animated video material
5.	Adobe Premiere Pro CC 2019	To compile animated video material
6.	Audacity	To edit the audio material
7.	Microsoft Word	To create documentation of the project

3.3.3 Hardware Requirement

Apart from software, hardware is also required for the development of this project. As a result, a personal laptop, smartphone, and wireless mouse are needed to develop the project. In addition, this hardware is required to ensure that the software that will be used can be run in good condition. The role of each of the hardware is explained in Table 3.2 below.

Table 3.2 Hardware for the Project

No.	Hardware	Purpose
1.	Personal Laptop	Runs all the required software and develop the eBook
2.	Smartphone	Used for viewing the eBook
3.	Wireless Mouse	Assisted in developing process and exploring process

3.4 Project Schedule and Milestone

This project is required to be developed around sixteen weeks. Therefore, the Gantt Chart for the project and milestones are essential and planned carefully to meet the objectives. Using a Gantt Chart and milestones can also help the project development stay on schedule and prevent the project development from being late, which could cause possible problems.

Table 3.3 below shows the Gantt Chart of the project activities for the development of the eBook. The first two weeks of the project activities started with the project briefing and preparing the project proposal. The proposal was then submitted between the third and fourth weeks. The plan for the project was analysed on the fourth and the fifth week. Once analysed, the multimedia elements for the project were chosen on the sixth and seventh week, respectively. The designs for the project were created from week seven until week thirteen. The project was also developed from week eight until week thirteen. For the testing and implementation of the project, progress was made from week thirteen until week fifteen. The project then was evaluated, and adjustments were

made from week fourteen until week fifteen. The report was documented from week four until the final week. Finally, the presentation of the project was done on week sixteen.

Table 3.3 Gantt Chart of the Project Activities

No	Project activities	Week																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1.	Project briefing																	
2.	Preparing the project proposal																	
3.	Proposal submission																	
4.	Analysis and project planning																	
5.	Choose the multimedia elements for the project																	
6.	Create design for the project																	
7.	Develop the project																	
8.	Testing and implementation of the project																	
9.	Project evaluation and make adjustments																	
10.	Report documentation																	
11.	The final presentation of the project																	

This milestone detail tells the start and finishes dates for all activities. The project lasted from January 29th, 2021, to September 3rd, 2021. The development of the project took about nine months to be completed. The project starts with the project briefing and the proposal preparation as well as the proposal submission. Next, the project requirements were analysed and planned. Following that, the multimedia elements for the project were determined, and the designing process of the project started. Then, the project was developed as planned. The following activity was the testing, and the implementation of the project was done. The project has then been evaluated, and adjustments were made from the evaluation received. The report of the project was also documented as planned. Finally, the final presentation for the project was organized to summarise the project development.

Table 3.4 Milestone of the Project Activities

No	Milestone	Start Date	End Date
1.	Project briefing	29th January 2021	29th January 2021
2.	Preparing the project proposal	30th January 2021	21st March 2021
3.	Proposal submission	22nd March 2021	26th March 2021
4.	Analysis and project planning	27th March 2021	4th April 2021
5.	Choose the multimedia elements for the project	5th April 2021	18th April 2021
6.	Create the design and content	19th April 2021	23rd April 2021
7.	Develop the project	24th April 2021	27th June 2021
8.	Testing and implementation of the project	28th June 2021	20th July 2021
9.	Project evaluation and make adjustments	21st July 2021	12th August 2021
10.	Report documentation	13th August 2021	2nd September 2021
11.	The final presentation of the project	3rd September 2021	3rd September 2021

3.5 Conclusion

In conclusion, the analysis process is vital in deciding the project progress. The requirement analysis tells the problem and the outcomes to develop the eBook successfully. Furthermore, the analysis process also defines the project requirements, software requirements and hardware requirements.

As for the project requirements, the project needs, the user, the technical, and the resources were being analysed carefully to ensure the development can be run smoothly without any barriers.

The hardware and software also need to be chosen whether the hardware and software used is suitable for eBook development. The Gantt Chart and project milestones have also been described to increase the efficiency of the project's development. The Gantt Chart and project milestones can help stay track in the project's development to avoid incidents.

The next chapter tells the project's design. The way a project is designed has an impact on how well the interactive eBook attracts users' attention. As a result, the interface must be eye-catching and make an excellent initial impression to persuade consumers to continue utilising the eBook. Therefore, the system architecture, preliminary design, and user interface design will be emphasised during the design stage.

CHAPTER 4: DESIGN

4.1 Introduction

In this chapter, the design of the project is explained. The design stage focused on the system architecture, preliminary design, and user interface design. All of the design plans are explained thoroughly as the design for the project is very crucial.

Text, pictures, music, video, and material are included in the raw form of multimedia elements. The parts and sources used in Adobe InDesign 2021 serve as the project's platform are also part of this phase. The designing process includes arranging the material of the eBook. The design of a project has an impact on attracting the user's attention. Thus, creating the interface needs to be eye-capturing and gives an excellent first impression to convince the users to use the eBook.

4.2 System Architecture

The system architecture is a conceptual model that tells the system's structure, behaviour, and other views. A formal description and representation of a system are arranged to facilitate reasoning about the system's facilities and behaviours.

Figure 4.1 below shows the flow of the system architecture for the eBook. The figure started with the user need to open the eBook using a device. Next, the user can view the cover and the table of content of the eBook. Then, the user can also view the learning outcomes, the past year questions, and the chapter's content. Finally, after each chapter, the quiz is prepared for the user to answer.

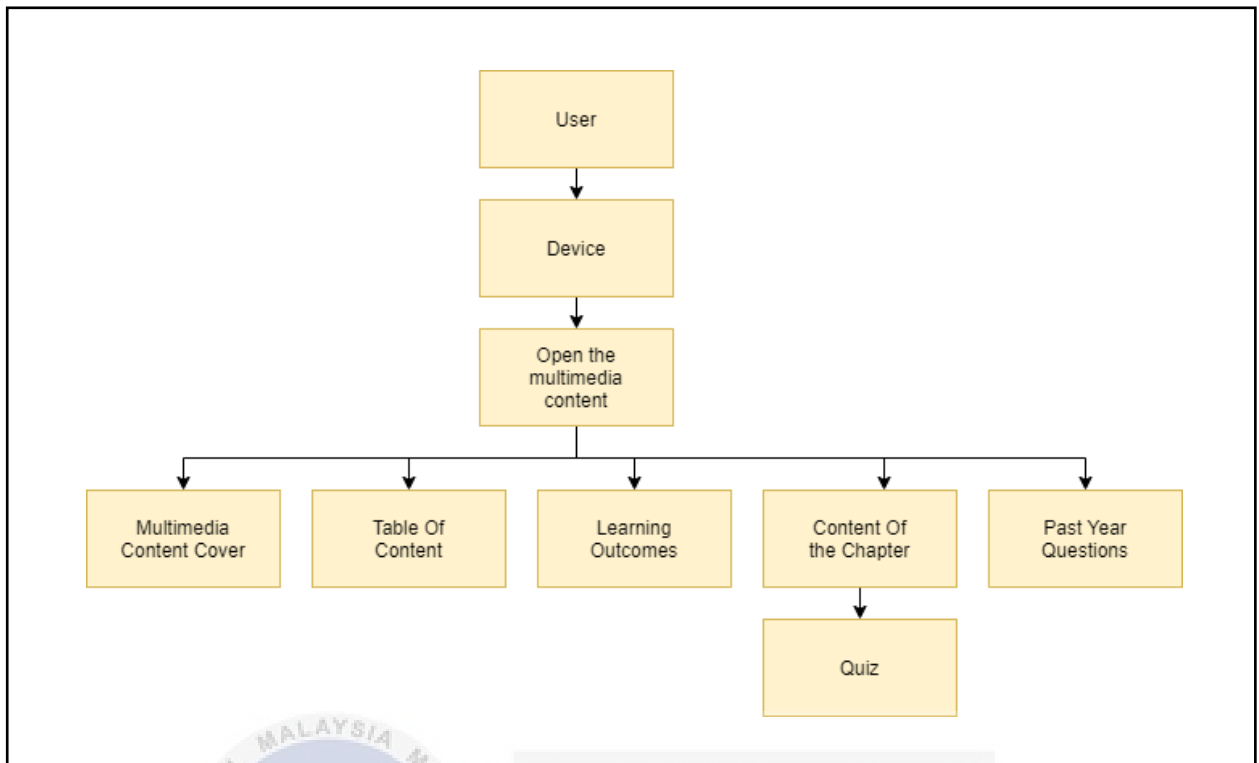


Figure 4.1 System Architecture

4.3 Preliminary Design

Preliminary design, often known as theoretical design, is the first phase for designing. This phase displays the overall design concepts that have been decided for the eBook. The goal of this initiative is to create a detailed design of the storyboard for the eBook.

The preliminary design is the application's high-level architecture design to generate a design that genuinely implements the requirement. Thus, a higher-level design product is produced during this phase. The system's architecture, including the eBook interface, was explained at a high level. The user interface design is one of the most significant components for project development to execute interface design, including storyboarding, navigation design, and user interface design.

4.3.1 Storyboard Design

The storyboard of the project is created to make sure the development process can be done smoothly. The storyboard design also is done to keep the schedule of development progress is on track as scheduled. Figure 4.2 below shows the storyboard of the eBook.

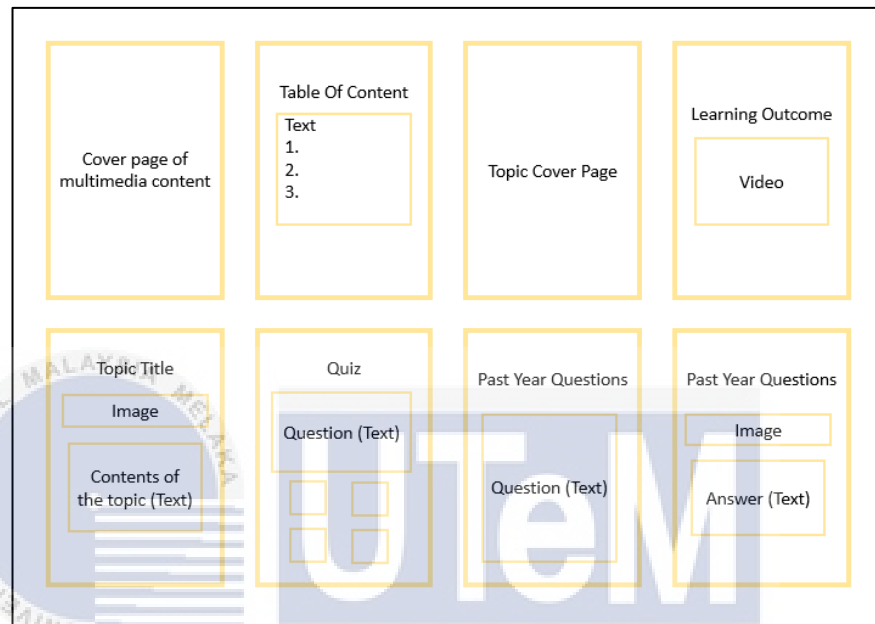


Figure 4.2 Storyboard Design

4.4 User Interface Design

The user interface is a medium that the user uses to interact with the eBook. User interface design is crucial because the user needs to understand the developer's content to relay to them. Thus, the user interface needs to be correctly designed to create an exciting and efficient environment to interact with the eBook. All of the figures below tell the type of user interface and the functions.

Figure 4.3 shows the main eBook interface—the cover page created on the minimalist theme. The colours used for the cover page were light blue, white, and dark blue. The font used for the page was Montserrat (Black).



Figure 4.3 eBook Main Interface

Figure 4.4 shows the table of content of the eBook. The table of content can assist the user in which page is the topic the user wish to see, and the table of content is clickable for the user to straightaway go to the desired page.

 The image shows a dark blue table of contents with white text. The title 'ISI KANDUNGAN' is at the top. The table lists various topics and their corresponding page numbers.

ISI KANDUNGAN	
Alih Bentuk Komunikasi	1
Graf Bar Kompaun	5
Graf Bar Komponen	7
Graf Bar Memesong	9
Graf Bar Piramid	11
Graf Garis Kompaun	14
Graf Garis Komponen	16
Graf Garis Memesong	18
Graf Gabungan	20
Carta Pai Berbanding	22
Carta Pai Bertingkat	24
Malaysia Maju Dan Sejahtera	28
Agama Dan Kepercayaan	32
Ekonomi	33
Politik	34
Prasarana	35
Sosial & Budaya	36
Ekologi	37
Sains Dan Teknologi	39
Soalan Graf Tahun Lalu	43

Figure 4.4 Table of Content

Figure 4.5 shows the title page for each topic in the eBook. The design interface shows the text, which is the title of the topic. The font used for the title was Montserrat (ExtraBold Italic).



Figure 4.5 The Title Page for Each Topic

Figure 4.6 shows chapters contents and information needed by the users by using the multimedia elements. in the eBook. There are text, images, animation, and audio used for these interfaces.



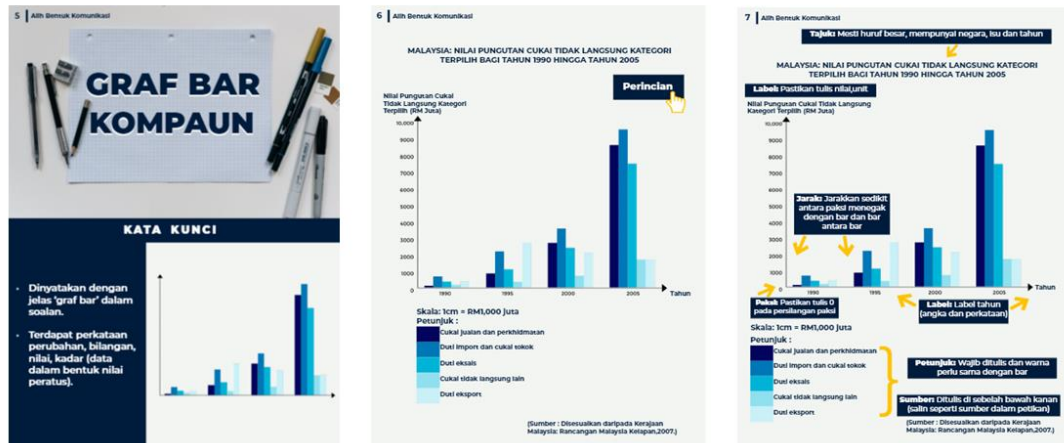


Figure 4.6 The Content/Learning Interface

Figure 4.7 shows the quiz first question interface for each topic in the eBook. The user can answer the question to test their understanding of the topic.

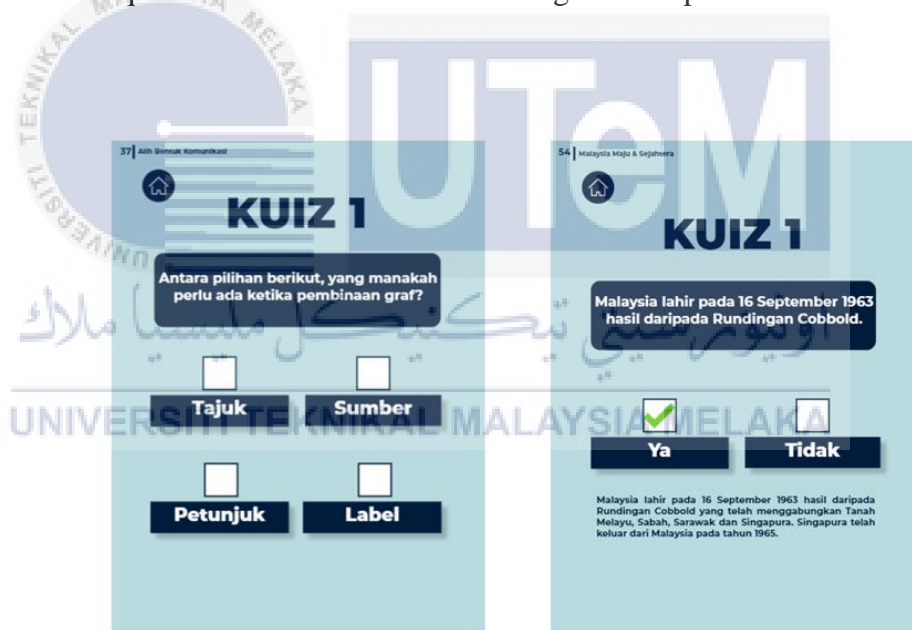


Figure 4.7 Quiz Interface

Figure 4.8 shows the interfaces of one question for the past year question in the eBook. For the first interface, the user can click on which question the user wish to view. Once the user clicked the button for the desired question, the user is automatically be bring to the question.

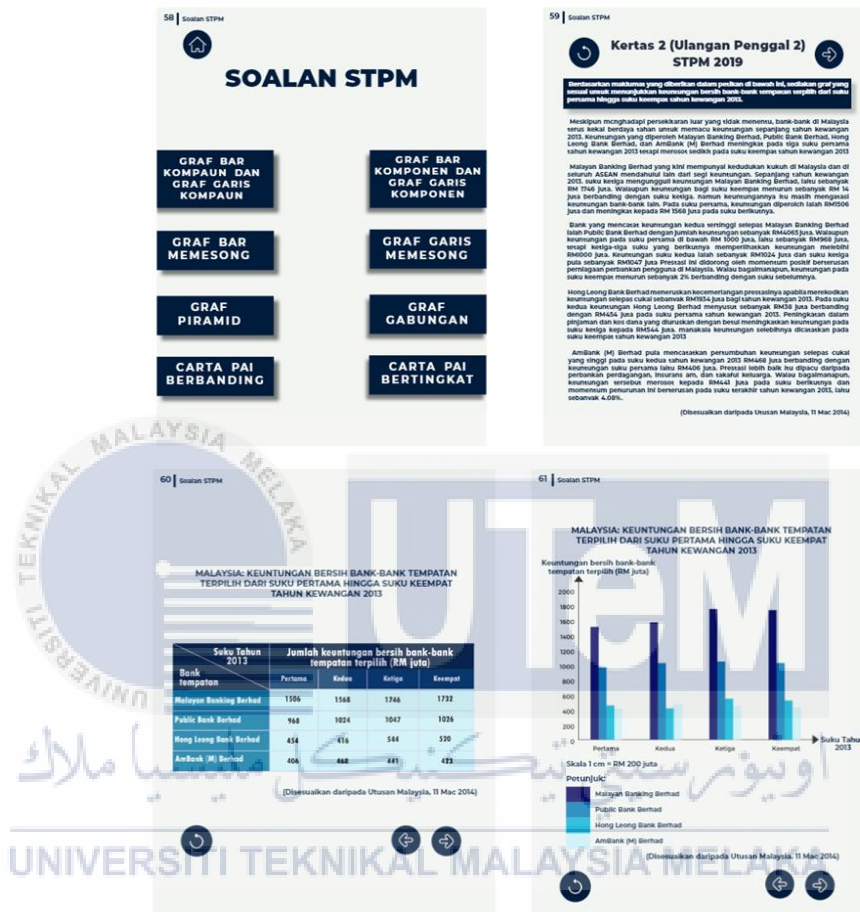


Figure 4.8 Past Year Questions

4.4.1 Navigation Design

The navigation design shows the eBook flow from the main page to the topic of the eBook. Figure 4.9 below shows the navigation design for this project. The navigation design for the project starts with the cover page of the eBook follows with the table of content. After that, the user may choose the contents of the eBook which were: (i) Topic one, (ii)Topic Two and (iii) Past Year Questions.

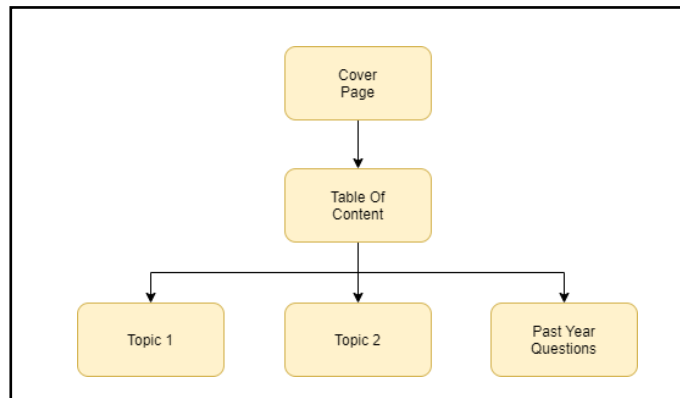


Figure 4.9 Navigation Design

4.5 Conclusion

This chapter describes the design development of the eBook. The design phase is crucial as this phase determines the structure of the eBook shown to the user. The elements of multimedia are implemented to make the project becomes more interactive and exciting.

The usage of system architecture tells the system's structure which help underlines the overall flow needed for the storyboard planning. The planning of the storyboard design helps to investigate the necessary features to deliver the contents successfully to the user. Then, the user interfaces design results from the eBook in terms of design progress from the beginning until the end.

Finally, the next chapter is the implementation of the eBook. The implementation chapter tells the activity involved in the implementation phase and the expected output.

CHAPTER 5: IMPLEMENTATION

5.1 Introduction

According to the previous chapter, the design architecture, design stage, and all multimedia aspects are required for the project's development. In addition, the project's implementation phase tells the detail of the development of an interactive eBook for the STPM General Studies Topic using Adobe InDesign.

The project has been discussed, produced, and planned in the proper manner for the interactive eBook to succeed. At this point, the design is being tweaked to make the design more user-friendly. The production includes all multimedia elements such as texts, audio, photos, and video. To ensure that the product is implemented, this chapter examines and covers the entire process, including media creation, media integration, product configuration management, and implementation status.

5.2 Media Creation

This interactive eBook goes through media elements such as text, graphics, video, music, and animation to entice users. Every aspect has been described, and all the elements have been used for the final creation of the project.

5.2.1 Production of Texts

Text is an essential multimedia element to complete the interactive eBook. Through text, users can comprehend the aim and the information of the project. The text used in the project tells the details of the description of the general studies subject.

Figure 5.1 depicts the text manufacturing process used to create this interactive eBook. Selecting the appropriate font to employ and generating more engaging and appropriate text to display the text, the ideal text size, and the appropriate colour to exhibit the information are just a few of the procedures to produce the text. The text was generated using Adobe InDesign.

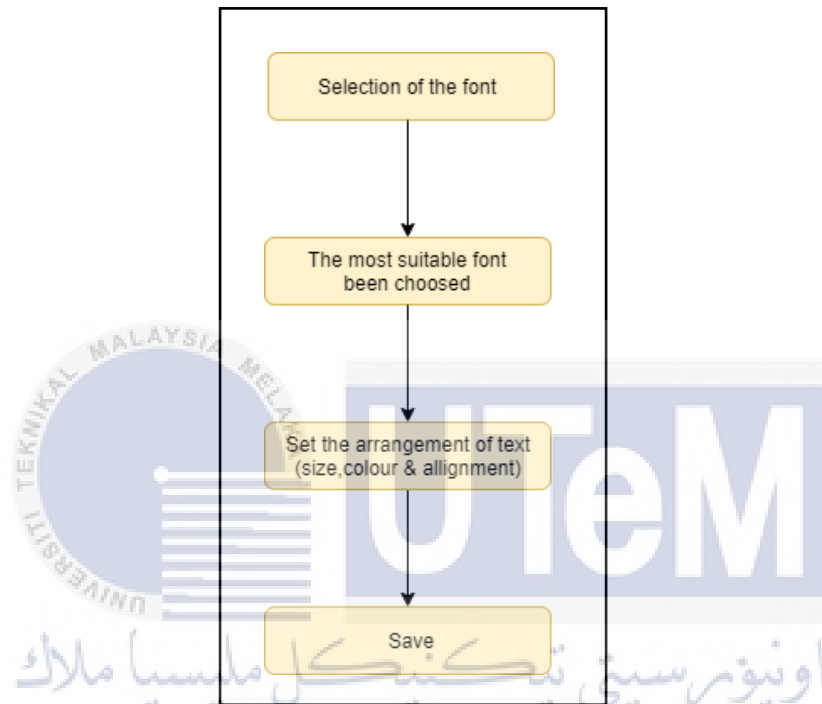


Figure 5.1 Process for Text Creation

Table 5.1 below shows the details about the font used. For the font used in the eBook, the Montserrat family font was chosen. Each of the font size for the font type were also shown in the table. The font used for the eBook front cover and the title for each page is Montserrat Black. For the cover page for each topic, Montserrat ExtraBold Italic was used. Graphs and charts details used Montserrat Bold. At the same time, key points for the notes used Montserrat SemiBold. Through the differences in the font format, users can easily distinguish between both title and the notes.

Table 5.1 Details of the Text Created for the eBook

Font Type	Font Size	Example
Montserrat Black	30pt 45pt 72pt 102pt	
Montserrat ExtraBold Italic	50pt	
Montserrat Medium	11pt	
Montserrat SemiBold	14pt	

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5.2.2 Production of Graphics

The production of graphics often is used to increase the user interest to read the eBook. In addition, the output of the pictures often makes the interface and make the eBook can be understood easily by the user—for example, using graphics to show the graphs and charts. Without the pictures, the graphs and charts cannot be explained clearly to the user. All the graphics created are in vector graphics with the help of Adobe Illustrator CC 2019 and Adobe Photoshop CC 2019.

Figure 5.2 shows the process of the graphics created for the eBook. The process starts by importing the reference image into the editing software. After that, recreate the image from the reference. Finally, produce the final image.

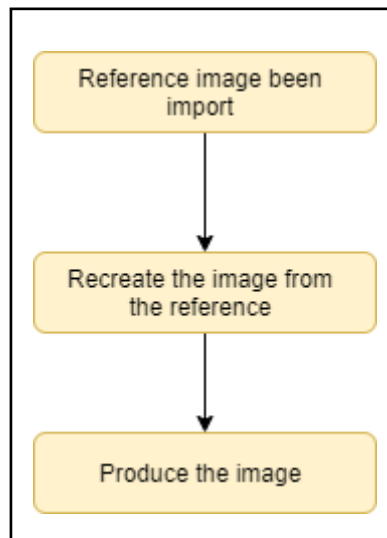


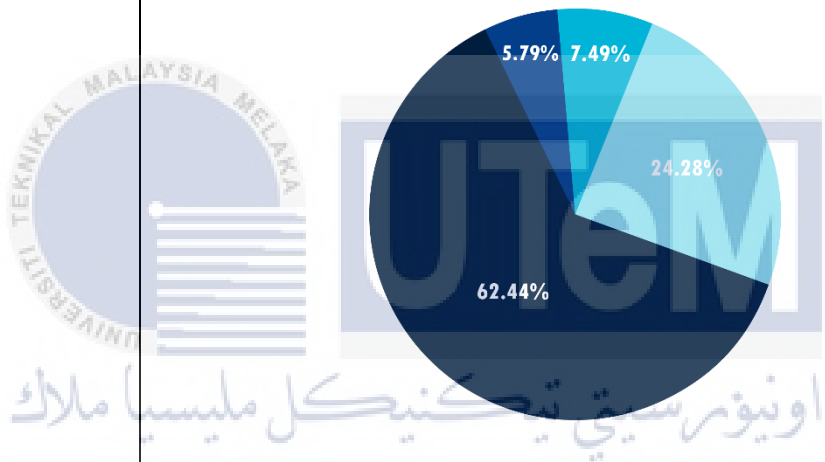
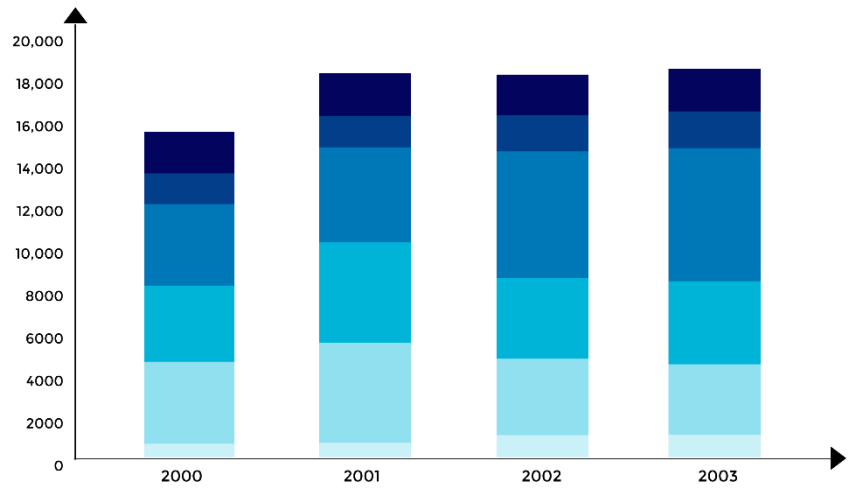
Figure 5.2 Process for Graphic Creation

Table 5.2 showed the sample graphic created. Table images, graphs, and charts pictures have been created for this interactive eBook. For the charts and graphs images, inputting the values is needed to make an accurate outcome. These mathematical features can be used in the Adobe Illustrator CC 2019.

Table 5.2 Details of Graphic Created

Text Type	Example																																																													
Table image	<table border="1"> <thead> <tr> <th rowspan="2">Jantina</th> <th colspan="3">LELAKI</th> <th colspan="3">PEREMPUAN</th> </tr> <tr> <th>Bilangan Orang</th> <th>Peratus</th> <th>Sudut</th> <th>Bilangan Orang</th> <th>Peratus</th> <th>Sudut</th> </tr> </thead> <tbody> <tr> <td>Bidang Pengajian</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Sains Matematik dan Komputer</td> <td>5474</td> <td>24.28</td> <td>87.40</td> <td>10 280</td> <td>36.53</td> <td>131.52</td> </tr> <tr> <td>Kejuruteraan Pembuatan dan Pembinaan</td> <td>14 079</td> <td>62.44</td> <td>224.79</td> <td>11 568</td> <td>41.11</td> <td>148.00</td> </tr> <tr> <td>Pertanian dan Veterinar</td> <td>1305</td> <td>5.79</td> <td>20.84</td> <td>1728</td> <td>6.14</td> <td>22.11</td> </tr> <tr> <td>Kesihatan dan Kebajikan</td> <td>1689</td> <td>7.49</td> <td>26.97</td> <td>4563</td> <td>16.22</td> <td>58.38</td> </tr> <tr> <td>Jumlah</td> <td>22 547</td> <td>100.0</td> <td>360</td> <td>28 139</td> <td>100.0</td> <td>360</td> </tr> </tbody> </table>							Jantina	LELAKI			PEREMPUAN			Bilangan Orang	Peratus	Sudut	Bilangan Orang	Peratus	Sudut	Bidang Pengajian							Sains Matematik dan Komputer	5474	24.28	87.40	10 280	36.53	131.52	Kejuruteraan Pembuatan dan Pembinaan	14 079	62.44	224.79	11 568	41.11	148.00	Pertanian dan Veterinar	1305	5.79	20.84	1728	6.14	22.11	Kesihatan dan Kebajikan	1689	7.49	26.97	4563	16.22	58.38	Jumlah	22 547	100.0	360	28 139	100.0	360
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Jumlah	22 547	100.0	360	28 139	100.0	360																																																								

Graphs and charts image



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5.2.3 Production of Audio

The development of audio is one of the crucial components because audio differentiates the eBook from existing book styles and makes learning more understandable and enjoyable for the user.

Figure 5.3 below shows the process of audio manufacturing for the project development. This process begins with the voice and music being recorded. Then, the audio has been cut and trim. Next, the audio was edited using the Audacity application. Finally, the audio has been imported into Adobe InDesign.

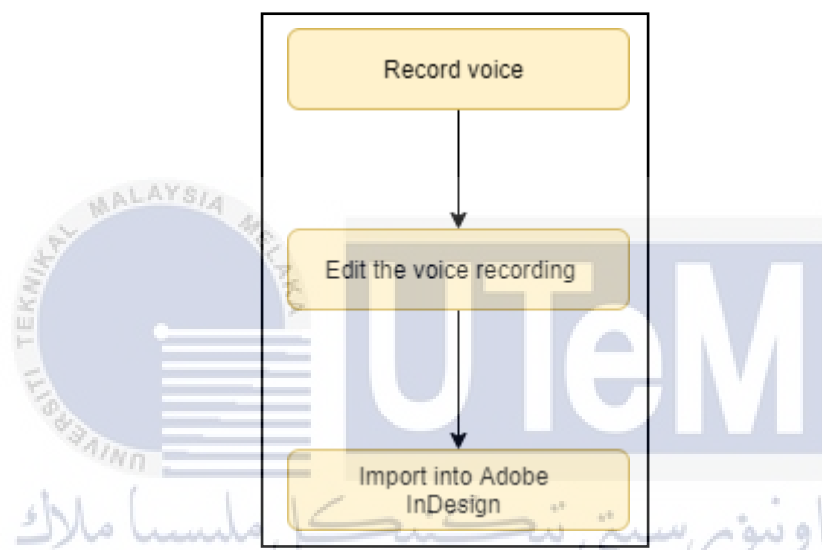

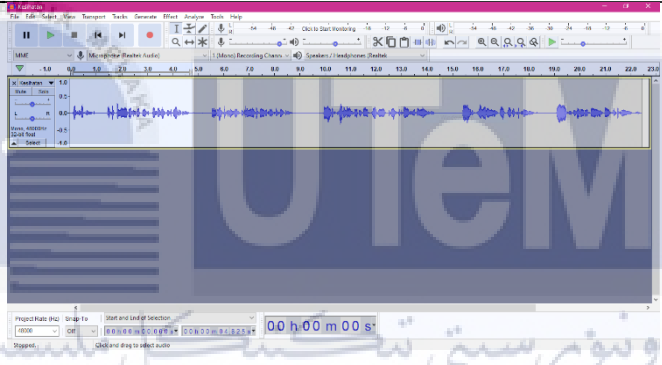


Figure 5.3 Process for the Audio Production

For this interactive eBook, Table 5.3 contains detailed information about the samples of audio editing. The audio was used for the chapter two topic. The audio explained the detail about the critical points for each subtopic for chapter two. The audio editing be done meticulously to ensure that the audio is clear and can be heard well. All the audio is exported into MP3 file format because Adobe software only can support the MP3 file format.

Table 5.3 Details of Audio Production

Process	Example	Software type
Audio recording		Voice Memos
Audio editing		Audacity

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5.2.4 Production of Video

Video production is also an essential aspect of this eBook. The videos were done for the learning outcomes because the video tells the objectives for the topic. Through the video, the user will understand the contents deeper as the user gets to know the learning outcomes for each topic earlier.

Adobe Premiere Pro CC 2019 and Adobe After Effects CC 2019 was used for the video's creation. The video sequences are placed according to the storyboard created, and parts that aren't necessary to be put are removed. The video files were produced in high resolution and exported in the H.264 file format, the most used MP4 format.

Figure 5.4 explains the process for the video production of this project. The production starts with making motion graphics for the text in Adobe After Effects and compiling the video created in Adobe Premiere Pro. After that, add some transitions between the videos inserted and place the audio needed. Lastly, rendering, exporting the video and import the video into Adobe InDesign.

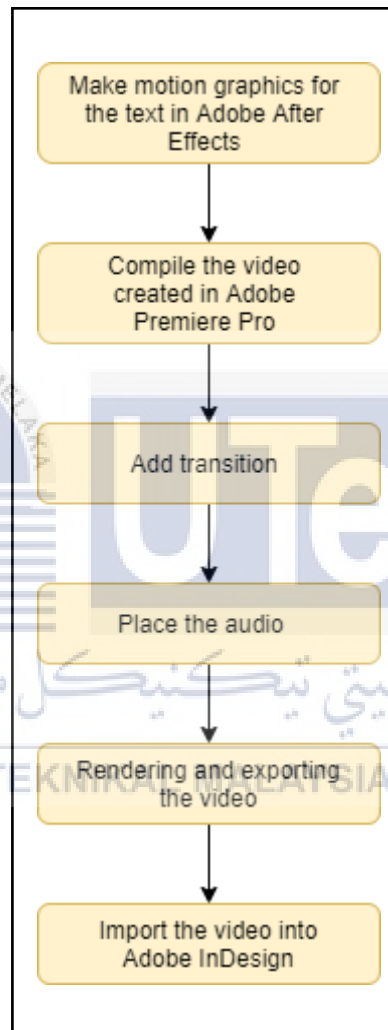
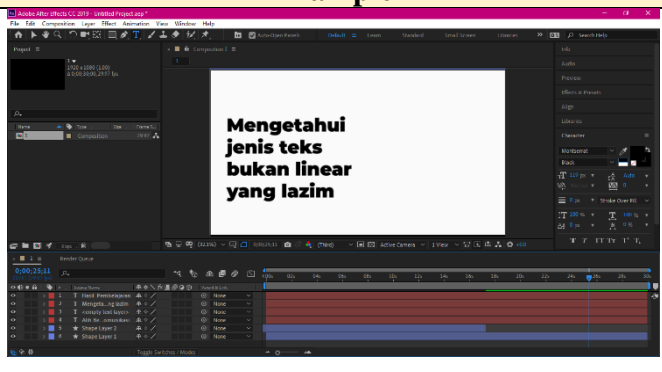
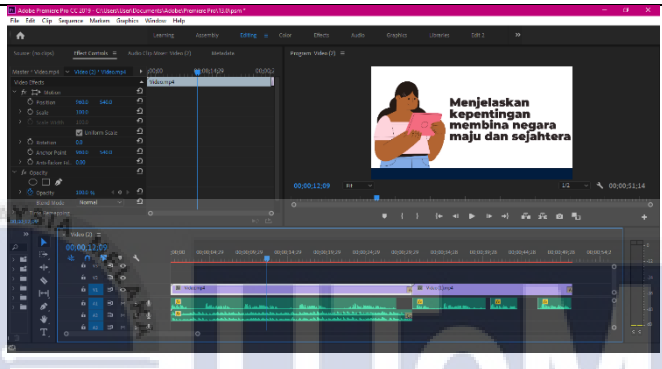


Figure 5.4 Process of Video Production

Table 5.4 below shows the process details of the video production. The video production of this project was used on Adobe Premiere Pro CC 2019 and Adobe After Effects CC 2019.

Table 5.4 Details of Video Production

Process	Example	Software type
Motion graphics		Adobe After Effects CC 2019
Video compiling		Adobe Premiere Pro CC 2019

5.3 Media Integration

The media integration of the project consists of multiple types of software tools. In terms of the design, Adobe Illustrator and Adobe Photoshop were used. The graphics for the graphs and charts were done using mathematical functions provided in Adobe Illustrator. Then, the graphics created were exported into PNG format before being placed in Adobe InDesign.

The production of the video was done on Adobe Premiere Pro and Adobe After Effects. The animated and motion graphics for the text was created on Adobe After Effects and exported into an AVI file. In comparison, Adobe Premiere Pro was used to compile all the videos created, place the audio, and identify the transitions. The videos have then been exported into an MP4 file format.

As for the audio production, Audacity was used for audio editing. The audio was recorded using an application called Voice Memos and been exported into an M4A file format. Due to the incompatible file format with Adobe InDesign, the audio was

converted into MP3 format to make sure the files can function well. The editing has been done in Audacity to remove the noises, hissing sounds and trim the unwanted audio. The outcome of the audios was exported into an MP3 file format.

Once the multimedia components were created, all the parts have been arranged in Adobe InDesign. Afterwards, the completed eBook in EPUB file form can be used using digital devices such as smartphones, tablets, and laptops through the EPUB reader.

5.4 Product Configuration Management

The product requires configuration management for product to accomplish the desired result. Setting up Adobe InDesign, Adobe Illustrator, Adobe Premiere Pro, and Adobe Photoshop are examples of the procedure for this phase.

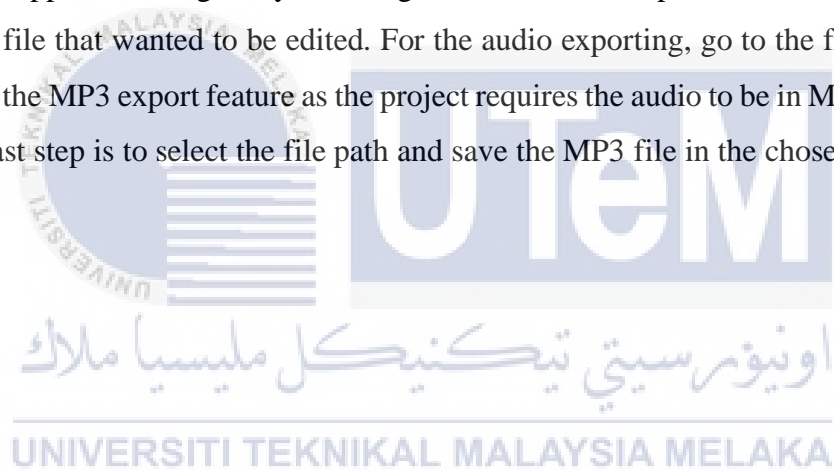
5.4.1 Configuration Environment Setup

The basic software settings for this project are specified in the configuration environment setup. The settings are gathered for a better view and knowledge of the setup. All the setup used in the software used for the interactive elements is shown in this part. These features from the applications used help to attract the user to use the interactive eBook. The setup for each software is different depending on the file type. The table for configuration setup been provided in the Appendix B section.

For Adobe InDesign software, the canvas is prepared firstly. The canvas is set to the size of size of 480px width by 640px height and the web is chosen as the intent for the project. Then, the file is exported into the EPUB (fixed layout) to save the file. In the Adobe Illustrator, the canvas is created by clicking on the create a new button and the canvas size is set depending on the required image size. The project is exported in PNG file type which the file path needs to be navigated and export button been clicked. As for the Adobe Photoshop, the first step is to create a new canvas by choosing the create new button and selecting the canvas size depending on the required image size. After that, the create button is clicked. Once the designing process is done, the image is saved as a PNG file.

The video creation of the project was done on the Adobe Premiere Pro and Adobe After Effects. In Adobe Premiere Pro, the canvas is created by selecting the file, new and project from the menu bar. Next, the file path of the project is selected. Then, select file, export and media to export the video created. Once a popup appeared, the output name is filled, and the file path and the export options are selected as well. While, Adobe After Effects started the project by clicking on the new composition to set up the canvas. HDTV 1080 29.97 setting is selected. Once the editing is completed, the file is exported by selecting the file, export and add to the render queue to begin the export setup. The file then is renamed as desired, and the file path been selected before the rendering starts.

The audio creation for the project was done on the Audacity application. The editing for the application begins by choosing the file bar and import the audio and select the audio file that wanted to be edited. For the audio exporting, go to the file, export and select the MP3 export feature as the project requires the audio to be in MP3 file format. The last step is to select the file path and save the MP3 file in the chosen file path.



5.5 Implementation Status

The interactive eBook's development progress is given in Table 5.5, and the implementation status of this project is discussed in the Gantt Chart method. The table below displays the length of each module that been completed before the set deadline.

Table 5.5 Implementation Status

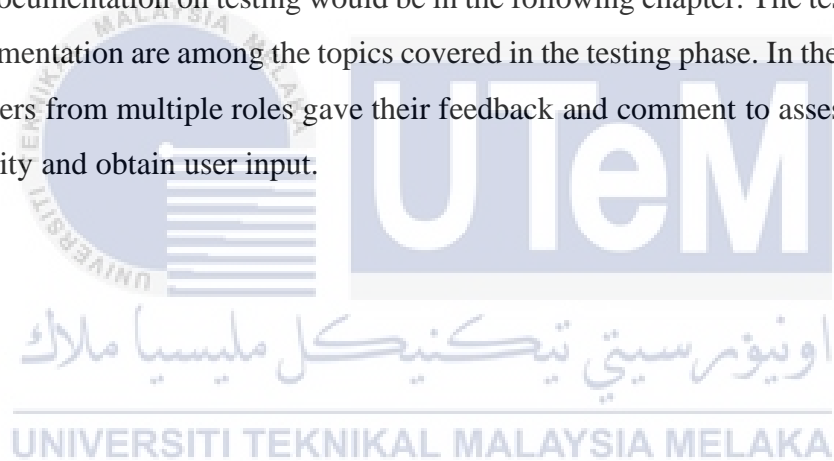
Week Module	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Date and duration	Status
Storyboard planning and creating																	28/3/2021 (2 weeks)	Complete
Interface design planning.																	2/5/2021 (5 weeks)	Complete
Creating multimedia features																	23/5/2021 (3 weeks)	Complete
Designing and assigning the content for all pages.																	4/7/2021 (6 weeks)	Complete

5.6 Conclusion

As for the conclusion, this chapter went through the processes used during the implementation stage of this interactive textbook project. Media generation, media integration, product configuration management, and implementation status are all part of the process for the project development. This chapter also shows media elements such as text, graphics, video, and audio in media creation.

Furthermore, the product configuration describes every software used for media editing, from canvas setup to export setup. Aside from that, when the schedule comes to the implementation status, the timeframes must ensure that the implementation in developing this eBook goes successfully during the set timeline of the Gantt chart.

The documentation on testing would be in the following chapter. The test plan and test implementation are among the topics covered in the testing phase. In the testing phase, the users from multiple roles gave their feedback and comment to assess the project's usability and obtain user input.



CHAPTER 6: TESTING

6.1 Introduction

After the implementation phase has been completed, testing will take place. After completing the development phase, the testing and evaluation phase is used to clarify the project's testing. Before the project can be deployed, the eBook functionalities are tested to ensure that everything works as expected. The test plan, which includes user, environment, and schedule tests, be covered in this chapter. Also, this topic covered strategy testing and implementation, as well as test results and analysis.

The testing was done using the questionnaire method for STPM students, teachers, and multimedia experts. The testing done for the students is the perceptions towards the interactive eBook of STPM General Studies Topic for Semester 2. This project had been tested to see if the interactive eBook is appropriate in terms of user experience and usability.

6.2 Test Plan

Establishing a test strategy in the early stages of the test is critical to ensuring that the project fulfils user requirements and specifications. This test plan includes user testing, environment testing, and a testing timetable. In this section, the testing phase plan was defined and documented, and the integrative testing approach was employed in the scheme for the required outcomes of the project. This interactive eBook was done for twenty-three of form six students. The respondents answering the questionnaire regarding their perceptions after using the interactive eBook compared with the traditional learning method that they have gone through.

6.2.1 Test User

There are two types of test users for the project which were experts (multimedia experts and teachers) and target user (students). Experts' tester were the subject matter expert that have experience in teaching the General Studies subject and multimedia experts in interactive textbooks with extensive knowledge. One multimedia lecturer and three multimedia students, and three teachers have been chosen to evaluate this project's interactive eBook. After reviewing the interactive eBook, all of the experts completed the questionnaire and provide feedback on the multimedia aspects and subject information of the interactive eBook.

The primary target user for this project was the target user, who are form six students in semester two that learn General Studies. Thirty-six students completed the questionnaire. This test be used to demonstrate the students' grasp of in several ways. After perusing the interactive eBook, they completed the perceptions questionnaire and commented on the interactive eBook.

6.2.2 Test Environment

The testing process takes place during the test environment. Testing for the eBook may be done anywhere because this eBook is a digital book. Due to the new norm of the learning and working environment, tests were conducted via Google Forms, Telegram, WhatsApp, and Microsoft Teams. Since the schools were closed and online learning was implemented, the testing takes place solely in the users' homes. During the testing, the users ensured that the area had appropriate illumination for greater visibility and favourable to eliminate distractions. The testing of the eBook was done on smartphones, laptops, and other digital devices.

6.2.3 Test Schedule

The test schedule is crucial because the schedule determined the moment for testing and the evaluation done suitably. The test schedule involves several factors such as the number of respondents, location, duration, and method to collect data of the testing session.

The testing was done with the recorded video demonstration video provided for the user to refer to for the testing session. The video explained about what an interactive eBook is, and the benefits, as well as demonstrate how to use this interactive textbook to users so that the users are aware of what the users going through.

The testing duration for this project is shown in Table 6.1. This table provides the tester's information, the number of respondents for the respective type of users, the time taken for the testing, the location of the testing, and the data collection method for testing this interactive eBook.

Table 6.1 Testing Schedule

	Experts testing	Target user testing
Tester	1. Multimedia experts 2. STPM General Studies teachers	1. Form six students at SMK Astana in semester two
Number of respondents	7	36
Duration	Within three weeks depending on the user's free time	Within three weeks, depending on the user's free time
Location	Users' respective location	Users' respective location
Data collection method	Online questionnaire	Online questionnaire

6.3 Test Strategy

Two types of testing were used in the test strategy: experts and target user testing. Expert's testing is used to assess this project's experience and understanding, particularly in multimedia and subject content. Expert's testing was done by multimedia experts and the subject matter expert. The subject matter expert review helped assist the project development by providing professional feedback and criticism that will aid in the improvement of this interactive eBook. All the experts express their thoughts and suggestions via a Google Form questionnaire. An instruction to using the interactive eBook was also included in the Google Form.

Target user testing focused on the form six students currently on semester two. The purpose of target user testing is to test the objectives and acceptance of this interactive textbook with the primary target consumers. The results of the questionnaire analysis determined whether this project met the project aims. There was a limitation for the testing with the target user. The developer cannot test this eBook face to face with the target users. This is because of the fact that all Malaysian schools were concerned about the COVID-19 case, which is increasing day by day.

As a result, the developer had difficulty collecting the data face to face from the intended users. As for the school chosen, SMK Astana students were selected as the target user's testers. SMK Astana is a school located in a rural area. The students were asked to answer a Google Form questionnaire regarding the perceptions towards the interactive eBook compared to the traditional method of learning at school. In the Google Form, a guide on using the interactive eBook was provided. Through this test, the student's perceptions of learning with the interactive eBook were analysed.

6.4 Test Implementation

Test implementation helps defined ways of testing been implemented on the users for the testing stage. Test description and test data are conducted on the test strategy and are related to this test implementation. This phase also extracted the test results from the questionnaire.

6.4.1 Test Description

The experts testing was conducted with the subject matter experts and multimedia experts after reviewing the interactive eBook. The questionnaire asked about specific details related to the eBook functions and the implementation of multimedia elements in the interface design of the eBook.

As for the target user testing, there were two options for the students to test the eBook. There is a demonstration video of the eBook for the students to watch. The students also can test the eBook by themselves as the guides of using the eBook was prepared in the questionnaire. Once the students are done trying the eBook, the students were required to answer the questionnaire through Google Form to assess the interactive eBook. The testing through the questionnaire can be found been provided in the Appendix C section.

6.4.2 Test Data

Following the testing session, the test data has been gathered and recorded. The outcomes were then documented and analysed. The goal of user acceptance and functionality testing is to see whether the project achieves the objectives specified in the first chapter. The results of all the tests are gathered and analysed.

6.4.2.1 Experts' Tester

The results of respondents who were the experts' testers who answered the questionnaire in sections A, B, and C are shown in the table below. Section A is about the general information of the testers. Section B is for the functionality were divided into three parts: effectiveness of the eBook, usability, and design of the project. While section C is for the comments or suggestions for improvement. Seven people responded to the survey. The questionnaire was done in a linear scale method that demonstrates a user's flexible close response.

Table 6.2 shows the first section of the questionnaire for the expert's tester, which was the general information regarding the testers.

Table 6.2 Section A: General Information

Role	Multimedia Expert	4
	Teacher	3
Gender	Male	1
	Female	6
Are you familiar with, or have any experience with, the use and teaching of interactive eBooks?	Yes	5
	No	2

Table 6.3 shows the second section of the questionnaire for the expert's tester, which was the testers perceptions regarding the functionality of the eBook. The linear scale method used for the project questionnaire was divided into four classes, as shown in the table below. There were 7 experts involved for the questionnaire. The experts has to assess the questionnaire by choosing from strongly disagree to strongly agree based on their opinions about this interactive eBook.

Table 6.3 Section B: Functionality of eBook

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

No	Question	Linear Scale			
		1	2	3	4
A	Effectiveness of eBook				
1.	The use of multimedia elements helps in the delivery of the interactive eBook.			1	6
2.	The use of multimedia elements can convey the syllabus well			1	6
3.	This interactive eBook will facilitate learning and teaching sessions			1	6
4.	This interactive eBook is easy to understand and clear.			1	6
5.	This interactive eBook can entice users to use it as learning material.			1	6
B	Usability				
1.	The notes for each topic are clear and easy to understand.			1	6
2.	The audio and video are clear and easy to understand.			1	6
3.	The quiz works well			1	6
4.	The various functions of this interactive eBook well integrated.			1	6
C	Design				
1.	The images used are appropriate to the content being presented.			1	6
2.	The selection of colours used is in line with the interactive eBook design.			3	4
3.	The interactive eBook design is very interesting and easy to understand.			1	6

4.	There is no unnecessary design and inconsistent interactive eBooks.		1	2	4
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Table 6.4 below shows the third section of the questionnaire for the expert's tester, which was the testers comments or suggestions for improvements of the interactive eBook.

Table 6.4 Section C: Comments or Suggestions for Improvement

No	Comments or suggestions for improvement
1.	I think the colour selection can be improved by choosing a softer colour like a soft blue.
2.	I really like it if you use soft colour or maybe a soft theme in your eBook. It can please people eyes and is much easier to understand.
3.	Overall, I believe the eBook works effectively. The inclusion of multimedia components is beneficial for content delivery. The colours are consistent but can be improved to be more appealing by using pastel colours instead of darker colours. This eBook even includes previous year questions and quizzes, making it ideal for students to learn and take notes.
4.	Overall, the system functions are good; every button and link is working. Usability and Design are good; bear in mind. However, eBook is not a replicate of the traditional book. Must creatively provide a proper layout, buttons that are easy to use and understand. You must creatively create the content using the multimedia element to support the learning. Otherwise, the learner will resort to traditional books.
5.	None because the preparation of this eBook is well made and covers complete aspects according to the General Studies syllabus

6.4.2.2 Target user's Tester

The results of respondents who answered the questionnaire in sections A, B and C are shown below. Section A is about the general information of the testers. Section B is for the functionality eBook. While Section C is for the comments or suggestions for improvement. The total number of target user who used the interactive eBook is thirty-six students.

Table 6.5 shows the first section of the questionnaire for the target user, which is the general information regarding the testers.

Table 6.5 Section A: General Information

Gender	Male	13
	Female	23
Have you ever used an eBook for STPM General Studies subjects for learning sessions?	Yes	10
	No	26

Table 6.6 below shows the second section of the questionnaire, which was the target user's perceptions regarding the functionality of the eBook. The questionnaire was done in a linear scale method that demonstrates a user's flexible close response and yes/no options. As for the linear scale method, the method was divided into four classes, as shown in the table below. There were thirty-six students involved for the questionnaire. The students have to assess the questionnaire by choosing from strongly disagree to strongly agree and yes/no based on their opinions about this interactive eBook.

Table 6.6 Section B: Functionality of eBook

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

No	Question	Linear Scale			
		1	2	3	4
1.	The notes for each topic in this interactive eBook are easy to understand and clear.		2	17	17
2.	The use of multimedia elements in this eBook is appropriate		4	10	22
3.	The support of a technical person to use this interactive eBook is needed.	1	6	17	12
4.	The various functions of this interactive eBook are well integrated.		1	8	27
5.	The design of this interactive eBook is appropriate and fun to use as learning material.		2	7	27
No	Question	Yes/No			
		Yes	No		
6.	Do you agree that the interactive eBook design is interesting and easy to understand?	36			
7.	Do you agree that the notes and quizzes in this interactive eBook help you test your understanding?	35	1		
8.	Do you agree that using this interactive eBook can help you understand more deeply before entering the class?	35	1		
9.	Do you agree that this interactive eBook is easy to use?	32	4		
10.	Do you agree that you would like to use this interactive eBook on a regular basis?	28	8		

Table 6.7 below shows the third section of the questionnaire, which was the target user' comments or suggestions for improvements to the interactive eBook.

Table 6.7 Section C: Comments or Suggestions for Improvement

No	Comments or suggestions for improvement
1.	Increase the audio sound for explanation
2.	Change the colour of the letters from white to black
3.	Use brighter and more colourful colours

6.5 Test Results and Analysis

Based on the outcomes of the testing and questionnaire, charts and graphs have been displayed in this chapter. Several charts and graphs were created to summarise the evaluated outcomes from the data acquired during the questionnaire testing. The results of the questionnaires were divided into two types: expert's testing test results and target user testing test results.

6.5.1 Testing Result Questionnaire for Expert's Testing

There are two types of experts at expert's testing: multimedia experts and teachers. For the multimedia expert, four respondents were chosen to be the testers for this project, each of whom has a unique multimedia skill in design and media. One male and three female are among the respondents for the multimedia experts.

As for the teachers, three female teachers had participated in reviewing the interactive eBook. All the teachers are experienced educators who were currently teaching the General Studies subject. Five out of seven experts are also familiar and had experience with interactive eBooks. While two out of seven were not familiar with the usage of eBooks.

These experts share their general information and assess their perceptions of the eBook's effectiveness, usability, and design of interactive eBook. The results have been analysed based on the questionnaire prepared.

Figure 6.1 shows the result of the five questions for the effectiveness of the eBook. From the result, the majority of the experts chose strongly agree. Six of the experts choose strongly agree for all of the questions above. Only one of the experts choose agree for each question. The questions were prepared to put more emphasis on the integration of multimedia elements in eBook can help people receive knowledge more effectively, learn more interactively, and present eBook content more clearly.

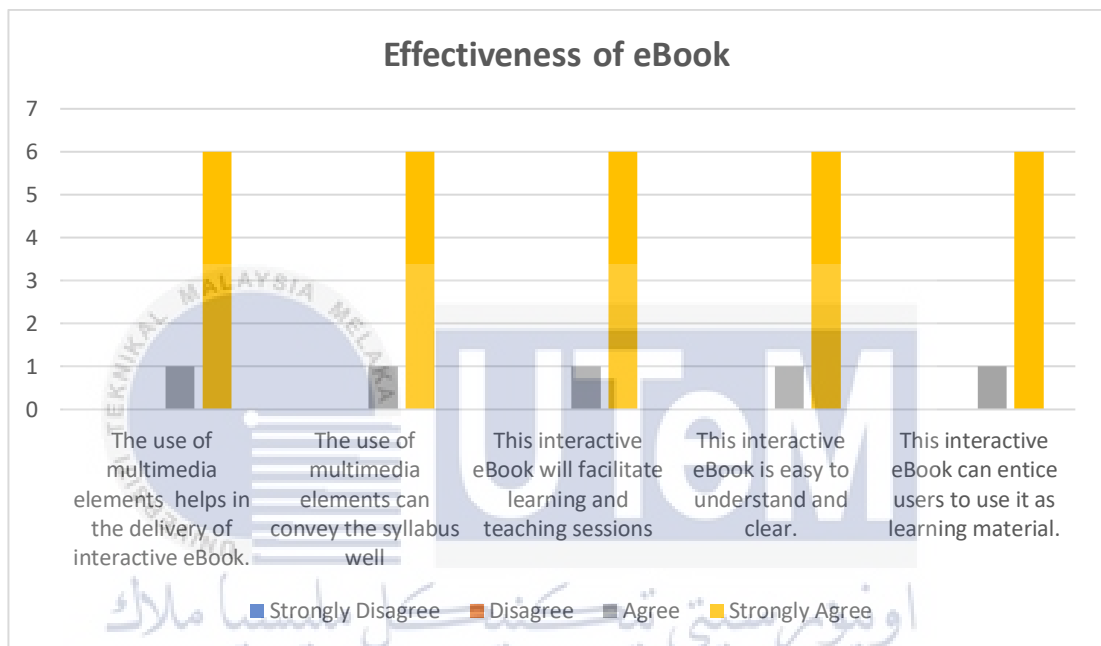


Figure 6.1 Insight of Effectiveness of eBook

Figure 6.2 above shows the results of the usability section of the questionnaire. In this section, there were four questions asked. From the figure above, most of the experts had chosen to strongly agree, which is six experts out of seven. In addition, one of the experts had chosen agree for all of the questions. This question focused on the usability of the features, the clarity of the contents and the corresponding functions with the eBook.

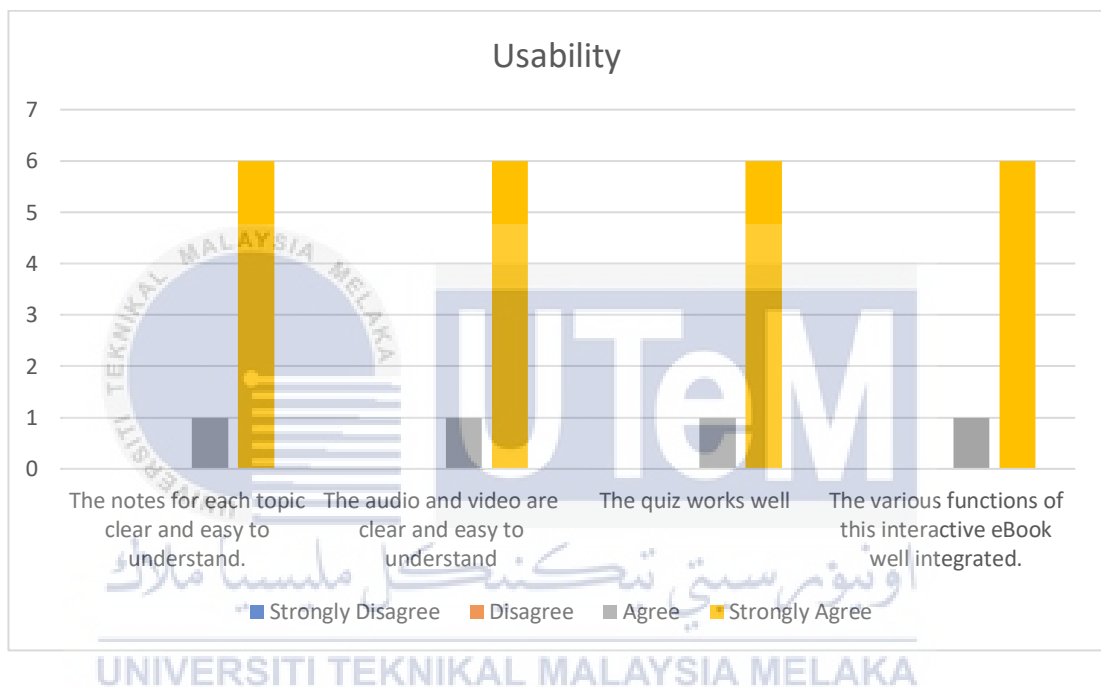


Figure 6.2 Insight of the Usability

Figure 6.3 above shows the result for four questions related to the design of the project. From the figure above, six out of seven experts choose strongly agree that the images used are appropriate to the content that has been presented, and the interactive eBook design is very interesting and easy to understand, while one expert chooses to agree. As for the question of the selection of colours used is in line with the design, four experts chose strongly agree, and three experts chose to agree. In addition, five experts chose strongly agree, two experts chose to agree, and one expert chose to disagree that there is no unnecessary design and inconsistencies in the interactive eBook. All of the questions were done for the evaluation of the interactive eBook design.

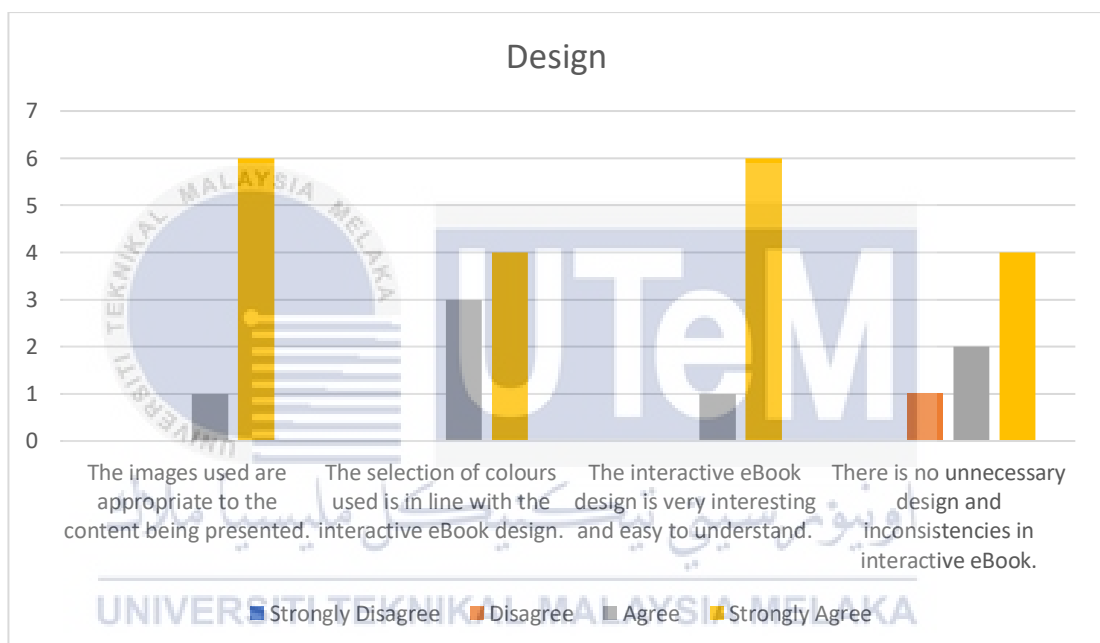


Figure 6.3 Insight of the Design

The third section of the questionnaire, Section C, was about the expert's comments or improvements suggestions. Five feedbacks were received from the respondents. Two of the respondents commented on the usage of softer colour as the theme of the eBook as softer colour may appeal to people's eyes. One of the respondents suggested to use pastel colours for the eBook design. One of the respondents commented that the interactive eBook is functioning well and may be improved on a more creative layout. The last comment given by one of the experts was the eBook is well made and completely covers all the aspects needed for the General Studies syllabus. After careful analysis of the interactive eBook design feature, not all of the suggestions for project

improvements were accepted. As for using the pastel colours suggestion, the suggestion was not implemented because the usage of colours of the eBook design used was already a soft colours that is attractive to people's eyes.

Ultimately, the questionnaire results received from the experts' tester shows a positive outcome. Furthermore, the test case of the result can be concluded as a success because most of the respondents choose strongly agree as their options for the questionnaire.

6.5.2 Testing Result Questionnaire for Target User Testing

This questionnaire has three sections in target user testing: section A for the general information of the testers, section B for the eBook's functionality, section C for comments or suggestions for this interactive eBook.

The testing was done by thirty-six form six students from SMK Astana who is currently in their second semester. SMK Astana is a rural school located in Jalan Sungai Lembing, Kuantan, Pahang. The respondents consist of thirteen male students and twenty-three female students. Through the testing, an analysis had been made based on the acquired questionnaire results.

Twenty-six out of thirty-six students had chosen that the testers have not used an interactive eBook for the STPM General Studies subject for the learning sessions. On the other hand, ten out of thirty-six had chosen that yes whether the testers had experience on using the eBook for STPM General Studies subject for learning sessions.

Based on Figure 6.4 above shows the result of the usability for the interactive eBook. For question one, the notes for each topic in the interactive eBook are easy to understand and clear. Seventeen respondents choose strongly agree, seventeen respondents choose to agree, and two respondent chooses to disagree. The second question was whether the respondent needs the technical person's support to use the interactive eBook. Twelve respondents choose strongly agree, seventeen respondents decide to agree, six respondents decide to disagree, and one respondent chooses strongly disagree. This question elicited mixed responses, as many of the testers required technical assistance to use the interactive eBook. The testers' grasp of the

interactive eBook technology is limited because the majority of the students have never used an eBook before and are from rural areas. For the third question, twenty-seven out of thirty-six students had chosen strongly agree that the various functions of the interactive eBook is well integrated. In comparison, eight students had chosen agree and one student chosen disagree. The result shows that the respondents' opinions vary according to the questions as the users are unfamiliar with using the interactive eBook.

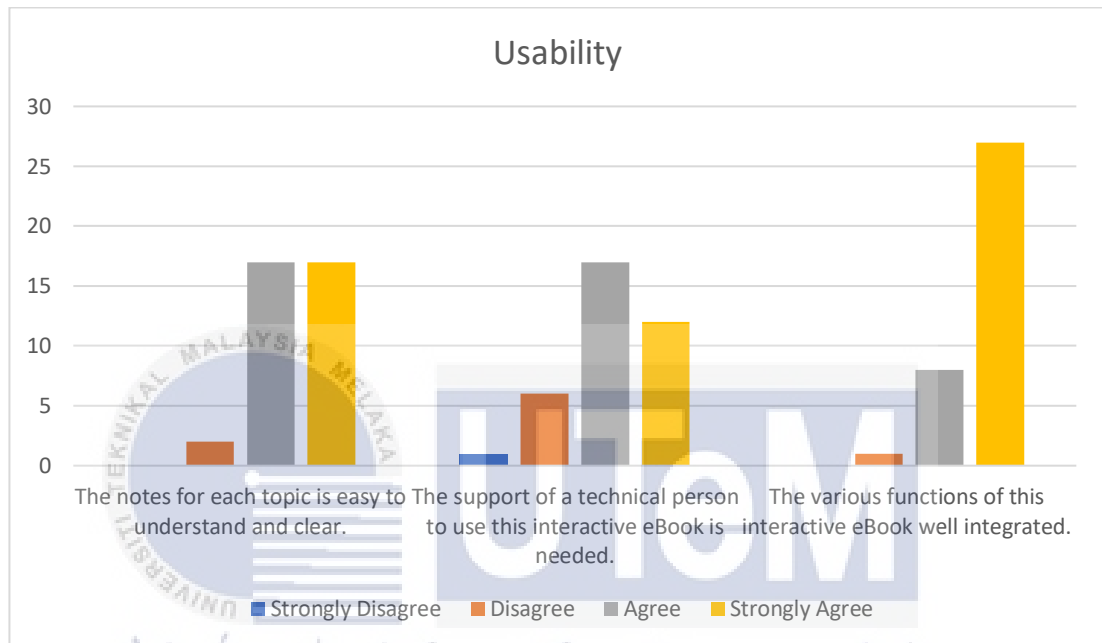


Figure 6.4 Insight of the Usability

Based on Figure 6.5, there are two questions had been asked regarding the design of the interactive eBook. The first question had the result of twenty-two respondents choosing strongly agree, ten respondents selecting to agree, and four students choosing to disagree that they find the interactive eBook's multimedia elements appropriate. The second question about the design of the interactive eBook is appropriate and fun to use as learning material. Twenty-seven out of thirty-six respondents choose strongly agree, while seven students decide to agree and two student choose to disagree. The result shows that there were respondents who thought that there is a need for improvement for a better design to make sure that the students feel enjoyable in using the interactive eBook.

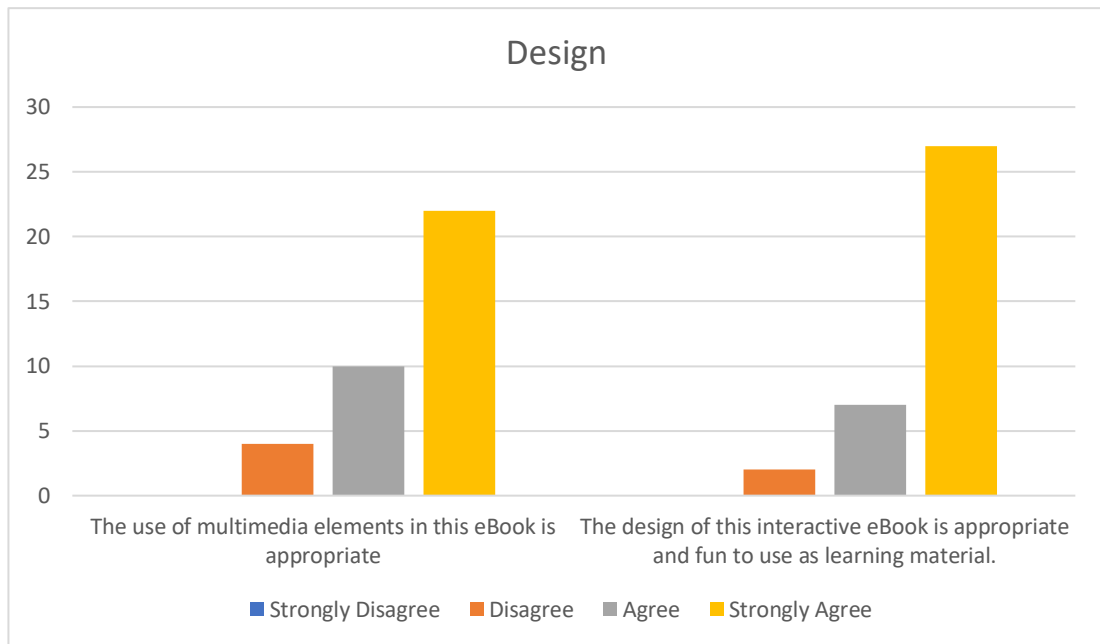


Figure 6.5 Insight of the Design

Based on Figure 6.6, results for five questions related to the interactive eBook's learnability were shown in the figure. All of the questions come with the option of yes or no. All of the thirty-six respondents choose yes that the interactive eBook is interesting and easy to understand. Two out of five questions which are questions two until three, received yes from thirty-five out of thirty-six respondents. For question four, whether the respondents agree that this eBook is easy to use gets a result of thirty-two respondents out of thirty-six choose yes while four respondents choose no. For the fifth question, twenty-eight respondents choose yes, and eight students choose no. The question was about whether the user wish to use the interactive eBook on a regular basis. Through the result received, most of the respondents find that the interactive eBook is learnable.

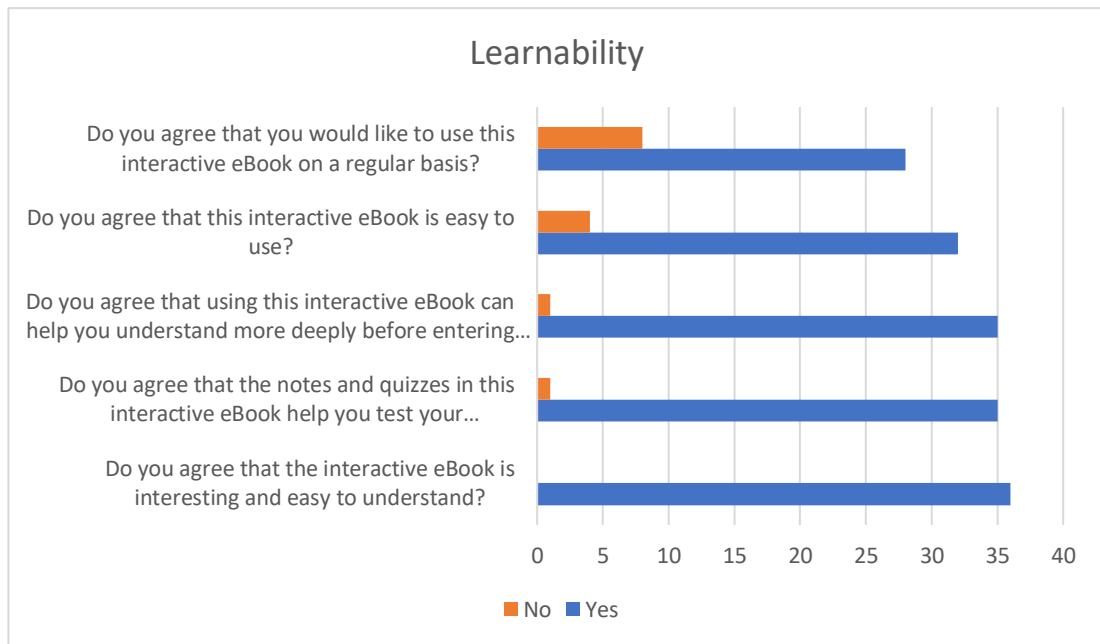


Figure 6.6 Insight of the Learnability

The respondent's remarks or suggestions for improvement were discussed in the third section of the questionnaire, Section C. There are three suggestions provided by the respondents. The first suggestion was to increase the audio sound for the explanation. The second suggestion was to change the colour of certain letters from white to black. Then, a respondent suggested using brighter and more colourful colours for the interactive eBook. The first suggestion which was to increase audio was taken as one of the improvements for the project.

Finally, the target user questionnaire findings indicate a favourable outcome. The result's test case is a success because most of the questions in the questionnaire received a positive response from the respondents.

6.6 Conclusion

Upon further analysis, the testing session's results were explained. This chapter is critical in obtaining feedback from the target user and ensuring that the project achieves the objectives outlined in the first chapter.

Based on the experts testing, the tester's questionnaire results indicate a positive outcome. Because the majority of respondents chose strongly agree and agree as their alternatives for the questionnaire. Besides that, the results of the target user testing for the questionnaire point to a positive outcome. Most of the questions in the questionnaire received a good response from the respondents, there is only one question that received mixed reactions as most of the testers needed a technical person to help them assisting in using the interactive eBook. As the majority of the students doesn't have experienced with using the eBook and came from a rural area, the testers' understanding regarding the interactive eBook's technology is limited.

In the next chapter, the conclusion for the project will be discussed. Then, the project's overall overview be documented. The chapter also covers the observation on strengths and weaknesses, propositions for improvement, and project contribution.

CHAPTER 7: CONCLUSION

7.1 Introduction

This chapter explained the project strength and the weakness of the Interactive eBook for the STPM General Studies Topic. Each strength and weakness were identified from the previous phase, which is the testing phase. Through the findings of the strengths and weaknesses, the flaws can be developed and improved simultaneously. Thus, allowing the user to benefit from the project strength.

The project contributions towards the STPM students and teachers also be clarified in this chapter. Thus, showing that the development of this eBook has been done from the user feedback from the user's experiences of using the eBook. Through the findings of the project, this interactive eBook meets the initial objectives of the project. The development of the project managed to explore the elements and requirements for the interactive eBook development. This project also accomplishes in developing an interactive eBook for the General studies subject. Through the testing and observations, the evaluation of the students' perceptions towards using the interactive eBook as a learning tool in the General Studies subject was also carried out successfully.

7.2 Observation on Weakness and Strengths

Every product has strengths and weaknesses. This project introduced a new method of learning and teaching by using technology as part of the procedures. This interactive eBook may help the students and teachers to use the interactive eBook during classes. Through the project's testing phase, the strengths and weaknesses of using this interactive eBook were identified. Through all the findings, the improvements that may be done in the future be clarify for better product development. All the

observations done was essential as to whether the product achieves the initial objectives of the project.

This interactive eBook's strength is that the eBook allows students to learn by using the multimedia elements such as video, audio, images, and interactive quiz. This eBook also has clickable buttons which can help the learning process and avoid boredom for the user. Furthermore, this eBook can be used on all types of digital devices regardless of the brand. The interactive eBook can be accessed through Android, iOS, Windows and macOS. Through these digital devices, the students and teachers can use the interactive eBook anywhere and anytime. This eBook also provides the past year questions, which helps the students understand the pattern of the questions commonly used for the examination. Thus, the students understanding may be increase and ease the teachers teaching process.

This interactive eBook's weakness is that the eBook only contained past year questions for graph and chart questions. Other than that, this eBook's weakness is the colours for the graphs and charts used only in the blue colour palette. Some of the users prefer that the graphs and charts graphics used colourful colours instead.

7.3 Propositions for Improvement

Propositions for improvement describe a viable idea for improving and enhancing the product's efficiency and capabilities. All the suggestions and comments from the users during the testing phase were used to strengthen the project developed into a better outcome. The feedback from the users helps the improvement to assist developers in identifying a product's fault or weakness so that the interactive eBook might perform better in the future.

After analysing, a proposition for improvement had been made to overcome the limitation and weaknesses of this project. The proposition for improvement is the colours used for the creation of graphs and charts images. The colours for each bar or line must be more colourful, which will help the user distinguish the difference between them. Some future features that could be included in this interactive eBook, the past year questions for chapter two, can be included in the contents.

7.4 Project Contribution

The final product, which is an Interactive eBook for STPM General Studies Topic, will help to improve the educational system so that the interactive eBook can be integrated into the digital world. As classes were done online due to pandemic COVID-19, this eBook will help the learning and teaching process both for the students and teachers. This eBook can also help students learn the subject in a more interesting way as this eBook provides a lot of clickable content that increases the interactivity when in use.

In addition, this interactive eBook also helps the teachers to use the interactive eBook as part of the teaching materials. The teachers can save time from finding multiple multimedia sources as this interactive eBook provides the notes for each chapter with detailed graphics, audio learning notes and interactive quizzes. Through all the interactivity provided in the eBook, the learning and teaching process will be enjoyable.

7.5 Conclusion

This chapter ensures that the final outcomes of the product achieved the project objectives. The objectives were exploring the elements and the requirements for interactive eBook development, developing an interactive eBook for the General Studies subject and evaluating the students' perception towards using the interactive eBook as a learning tool in the General Studies subject. The users can use the interactive eBook to read notes, watch the videos of the chapter learning outcomes, understand ways to draw graphs, listen to audio help for notes, answer quizzes to test their understanding, and examine the past year's questions.

In conclusion, this project successfully developed from the main plan, and all the project's objectives have been met. This eBook has the potential to be a new platform for making studying and teaching more enjoyable. This eBook also may greatly aid the students' comprehension of the subject. A further enhancement could be incorporated in the future to make this eBook more engaging.

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Tc. Faiz Hazizi. (2021). Pengajian Am (STPM): Semester 2 - Bahagian A : Soalan Struktur - Cikgu Abdul Manaf Bin Hassan. [Online Video]. 11 June 2020. Available from: <https://www.youtube.com/watch?v=p7sqmG9MSZg>. [Accessed: 7 March 2021].

Tc. Faiz Hazizi. (2021). Pengajian Am (STPM): Bahagian B : Linear Kepada Bukan Linear - Cikgu Abdul Manaf Bin Hassan. [Online Video]. 30 April 2020. Available from: <https://www.youtube.com/watch?v=HH4yXaxaXrw>. [Accessed: 7 March 2021].



APPENDIX A: INTERFACE DESIGN

A. Interface Design Interactive eBook for STPM General Studies Topic





KATA KUNCI

- Dinyatakan dengan jelas 'graf bar' dalam soalan.
- Terdapat perkataan perubahan, bilangan, nilai, kadar (data dalam bentuk nilai peratus).

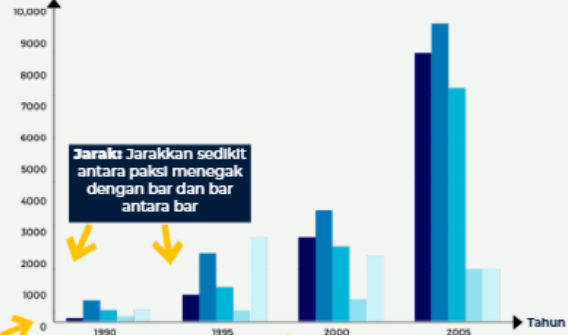


Tajuk: Mesti huruf besar, mempunyai negara, isu dan tahun

MALAYSIA: NILAI PUNGUTAN CUKAI TIDAK LANGSUNG KATEGORI TERPILIH BAGI TAHUN 1990 HINGGA TAHUN 2005

Label: Pastikan tulis nilai, unit

Nilai Pungutan Cukai Tidak Langsung Kategori Terpilih (RM Juta)



Paksi: Pastikan tulis 0 pada persilangan paksi

Label: Label tahun (angka dan perkataan)

Skala: 1cm = RM1,000 Juta

Petunjuk :

- Cukai Jualan dan perkhidmatan
- Duti import dan cukai tokok
- Duti eksals
- Cukai tidak langsung lain
- Duti eksport

Petunjuk: Wajib ditulis dan warna perlu sama dengan bar

Sumber: Ditulis di sebelah bawah kanan (salin seperti sumber dalam petikan)

(Sumber : Disesualkan daripada Kerajaan Malaysia: Rancangan Malaysia Kelapan, 2007.)



APA ITU MAJU?

MAJU

Maju merupakan suatu keadaan perubahan ke hadapan menjadi lebih baik daripada keadaan sekarang.

APA ITU SEJAHTERA?

SEJAHTERA

Sejahtera mengikut istilah adalah bermakna aman dan makmur, tenang dan tenteram serta terpelihara daripada bencana daripada kesusahan dan gangguan.

Pelbagai faktor yang mendorong rakyat Malaysia berada dalam keadaan aman dan sejahtera.

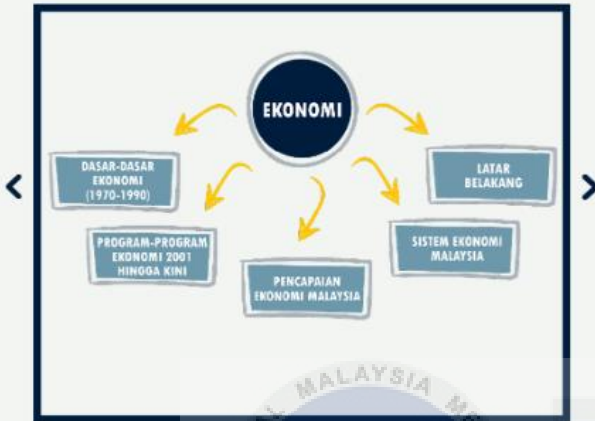
Antaranya keadaan ekonomi yang semakin berkembang, keadaan politik yang terpelihara, hubungan antarabangsa yang baik serta dihormati dan lain lain.

Maju sesebuah negara bangsa pula menunjukkan keadaan bertambah baik dan menunjukkan ketamadunan.

Negara maju merujuk kepada negara yang menikmati tahap pembangunan yang tinggi berdasarkan ukuran-ukuran tertentu.



EKONOMI



PRASARANA

▶ 0:00 / 0:16

PENDIDIKAN

- Peruntukan perbelanjaan pendidikan sentiasa ditambah dalam bajet tahunan.
- Peruntukan dibahagikan kepada pengurusan dan pembangunan.
- Meningkatkan kemahiran sumber tenaga dengan PdP yang berkualiti.
- Pendidikan dan buku teks percuma.



PENDIDIKAN



KESIHATAN



PENTADBIRAN



TELEKOMUNIKASI



PENGANGKUTAN



KUIZ 1

Antara pilihan berikut, yang manakah perlu ada ketika pembinaan graf?



Tajuk



Sumber



Petunjuk



Label



SOALAN STPM

GRAF BAR KOMPAUN DAN GRAF GARIS KOMPAUN

GRAF BAR KOMPONEN DAN GRAF GARIS KOMPONEN

GRAF BAR MEMESONG

GRAF GARIS MEMESONG

GRAF PIRAMID

GRAF GABUNGAN

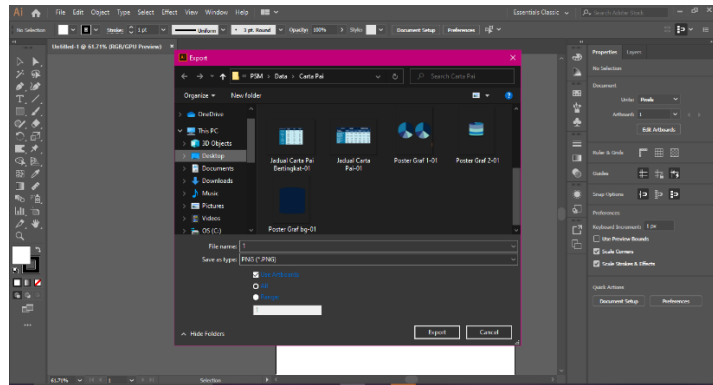
CARTA PAI BERBANDING

CARTA PAI BERTINGKAT

APPENDIX B: SETUP CONFIGURATION

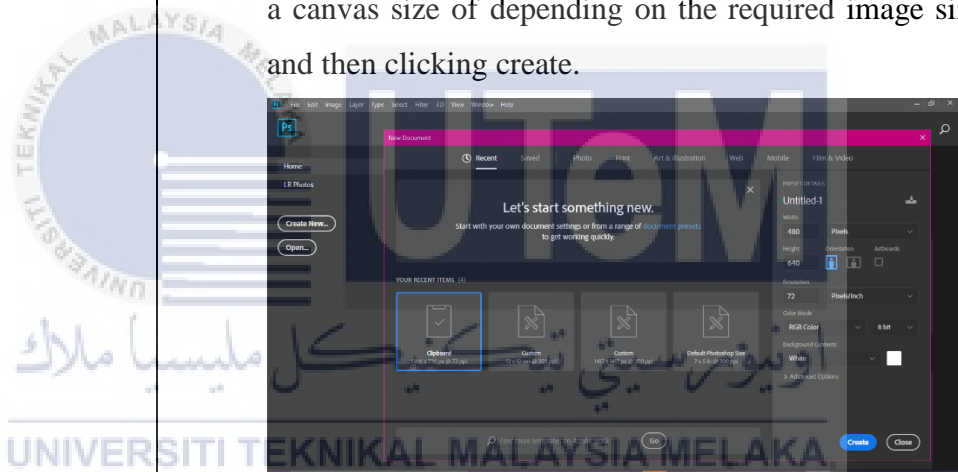
Software	Setup configuration
<p>Adobe InDesign</p>	<p>1. Prepare the canvas. Choose the web intent and a canvas size of 480px width by 640px height.</p>  <p>2. Save the file as an EPUB (fixed layout).</p> 
<p>Adobe Illustrator</p>	<p>1. Create a new canvas by choosing the create a new button, then selecting a canvas size depending on the required image size and clicking create.</p> 

- To export, select PNG as the file type, then navigate to the file path and click export.

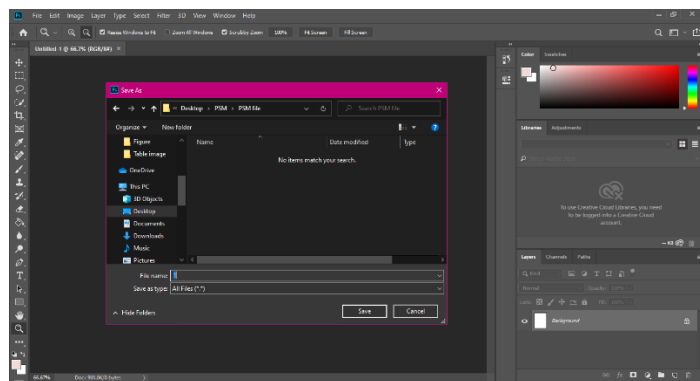


Adobe
Photoshop

- Create a new canvas by choosing to create new, selecting a canvas size of depending on the required image size, and then clicking create.

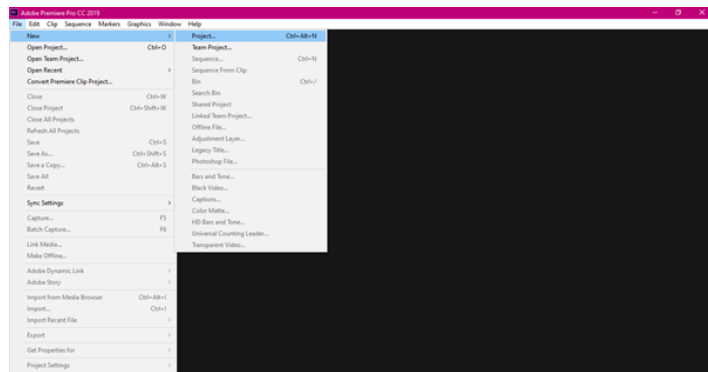


- Export the configuration

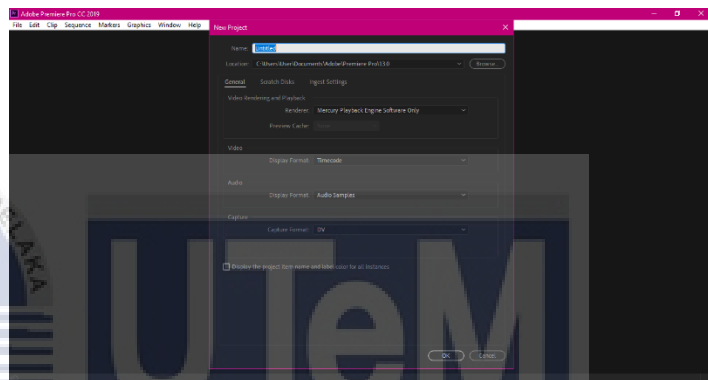


Adobe Premiere Pro

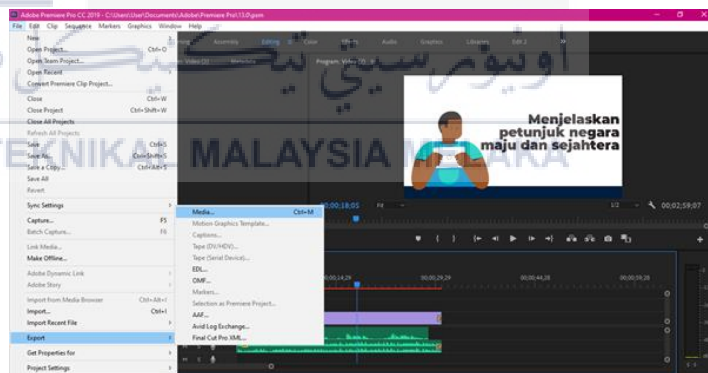
1. Create the canvas by selecting file, new, and project from the menu bar.



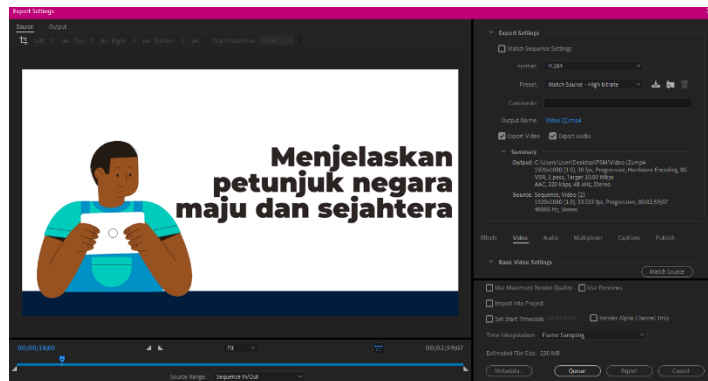
2. Select a file path.



3. Select file, export, and media to export the video.

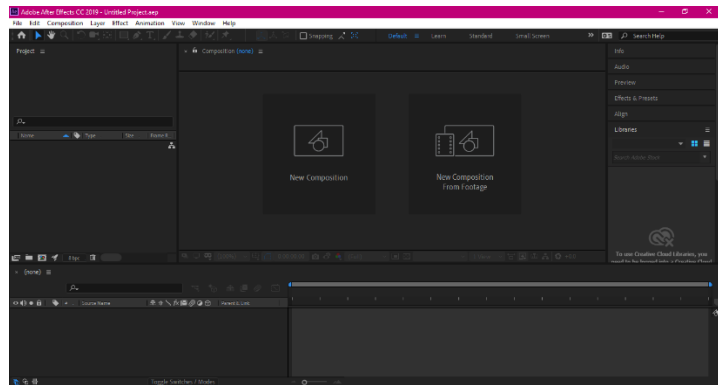


4. Select the output name, file path, and export options.

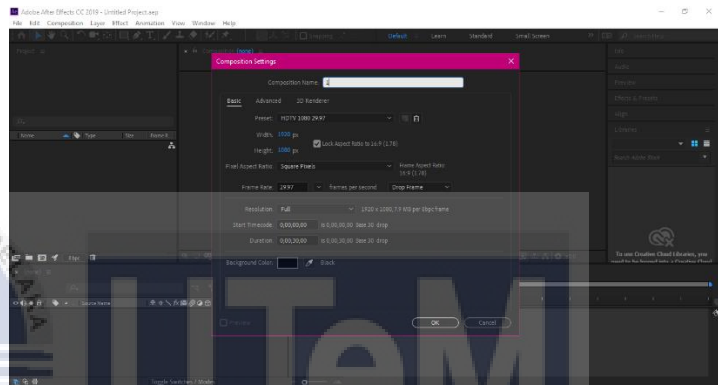


Adobe After Effects

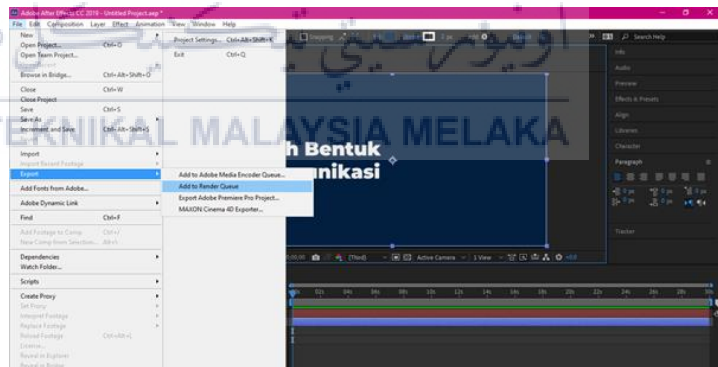
1. Click on the new composition to set up the canvas.



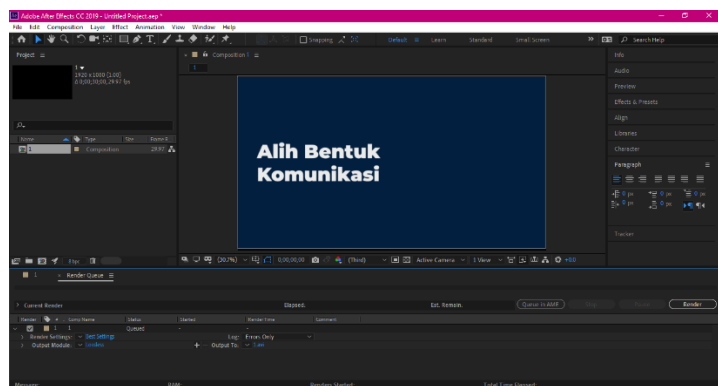
2. Select HDTV 1080 29.97 as the setting and click OK.



3. Select a file, export the project, and add the project to the render queue to begin the export setup.

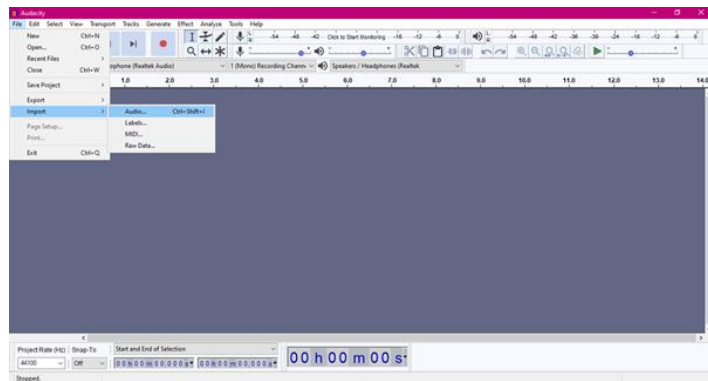


4. Rename the file, select the file path, and render.

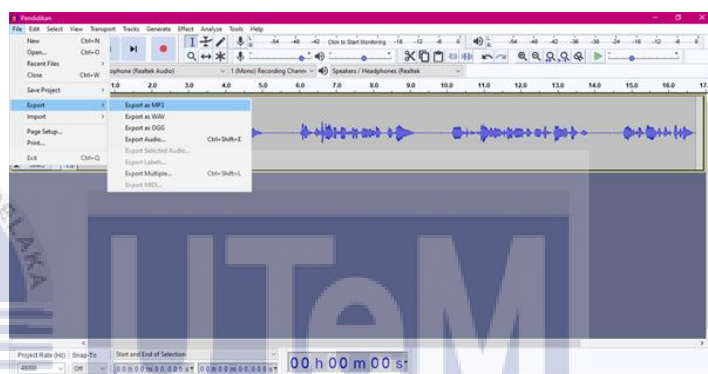


Audacity

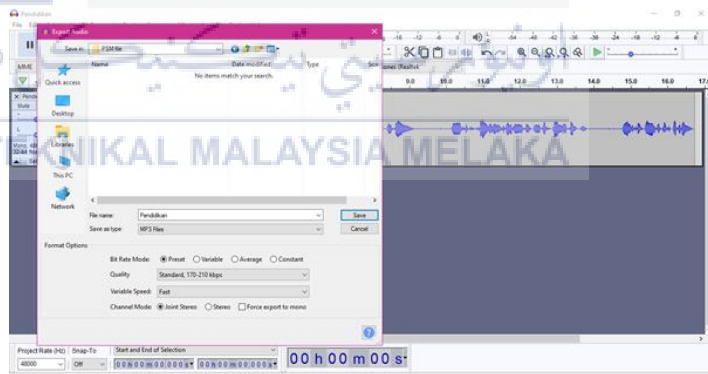
1. To begin editing the audio, go to file, import, audio, and select the audio file you want to work with.



2. To export, go to File, Export, and MP3 Export.



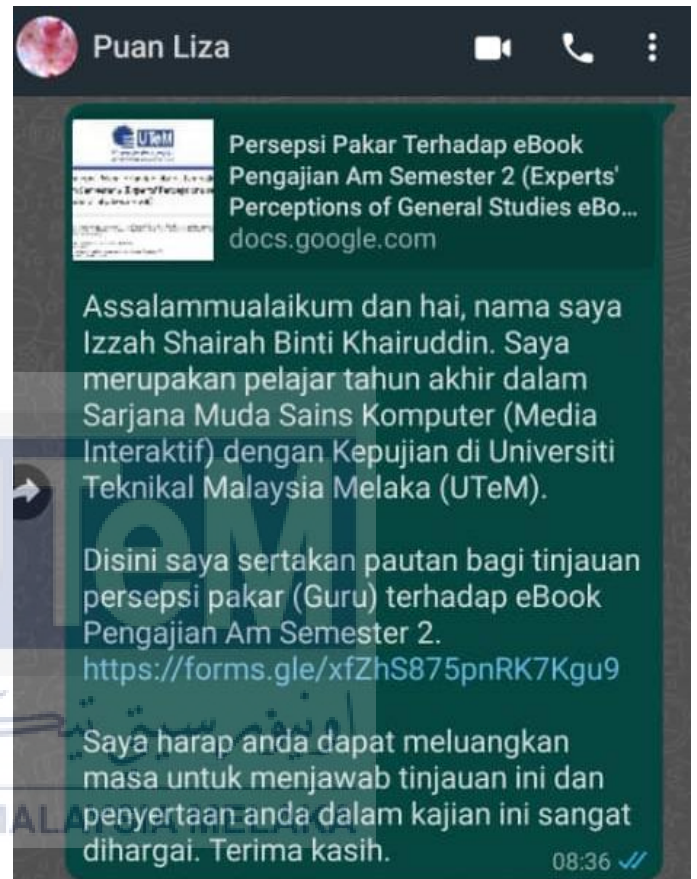
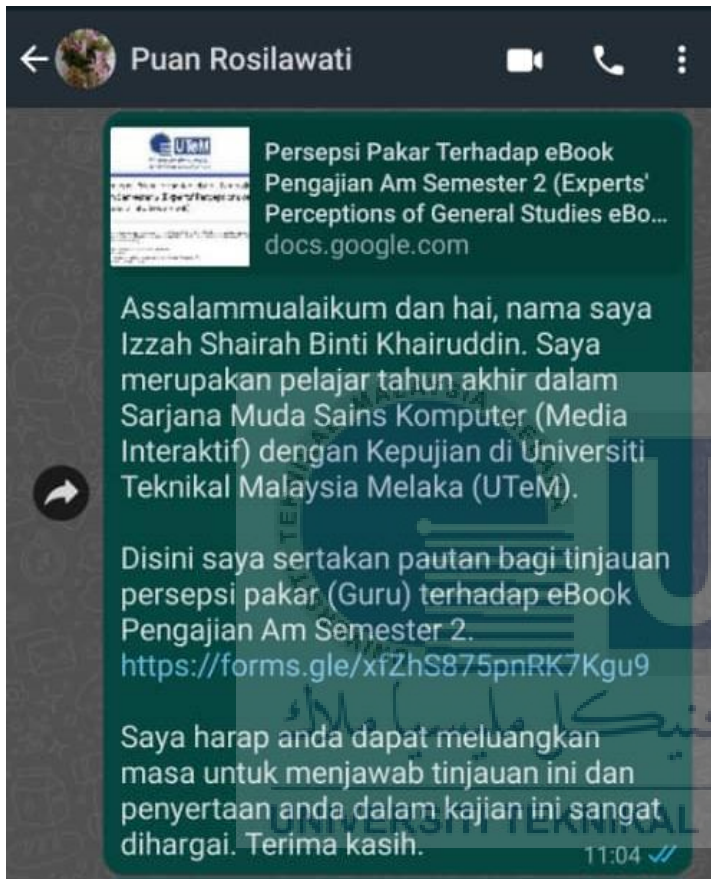
3. Next, select the file path and save the file.

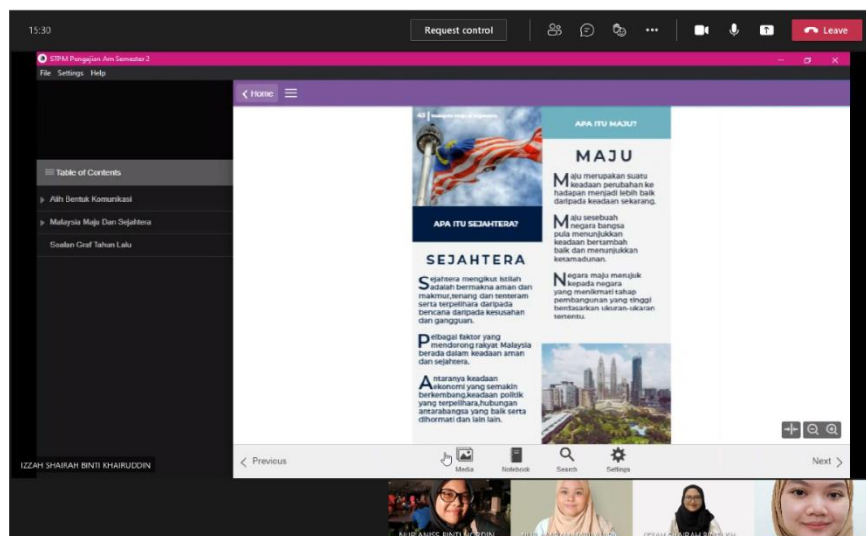
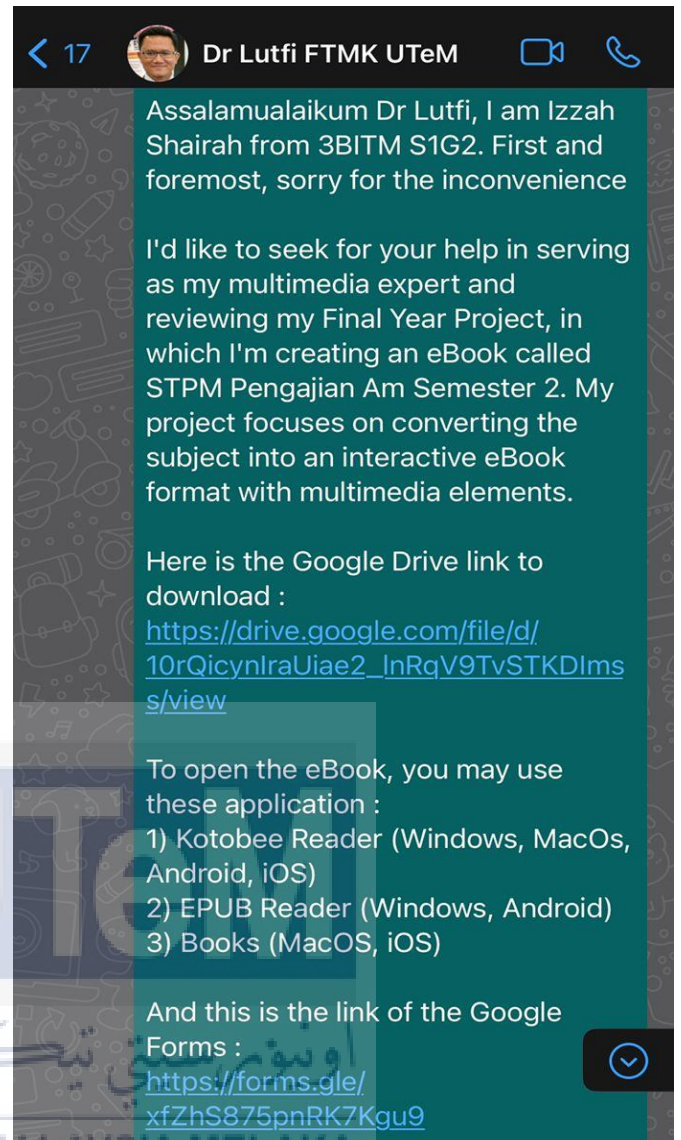
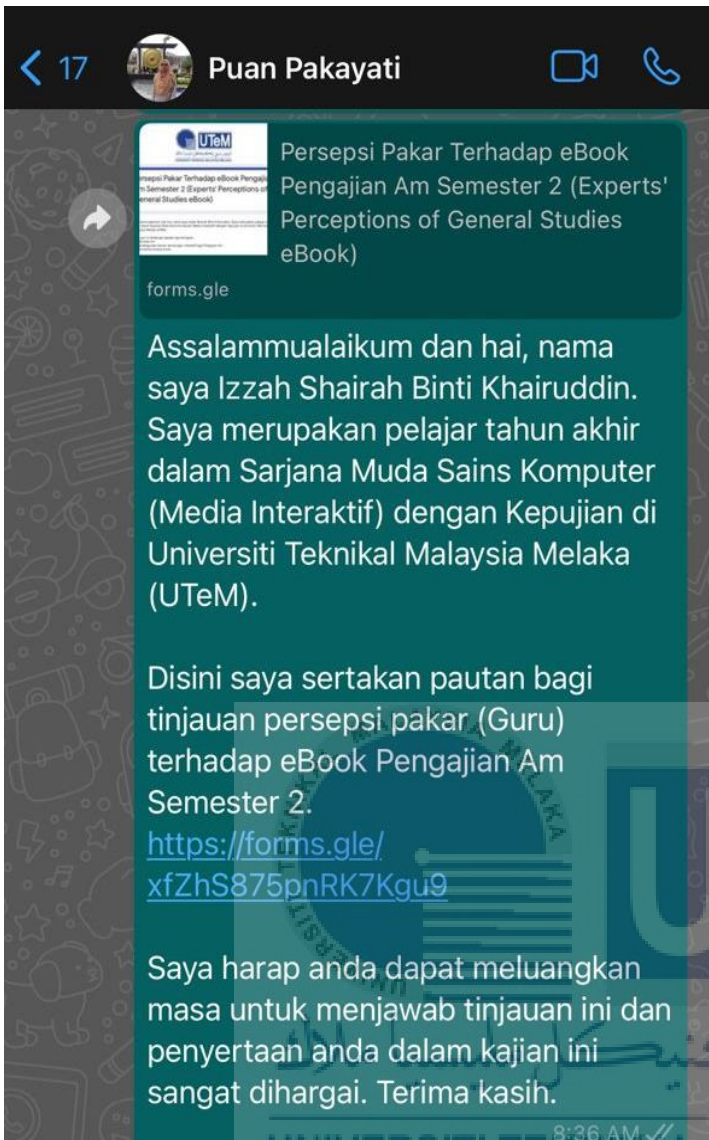


APPENDIX C: QUESTIONNAIRE FOR TESTING PHASE

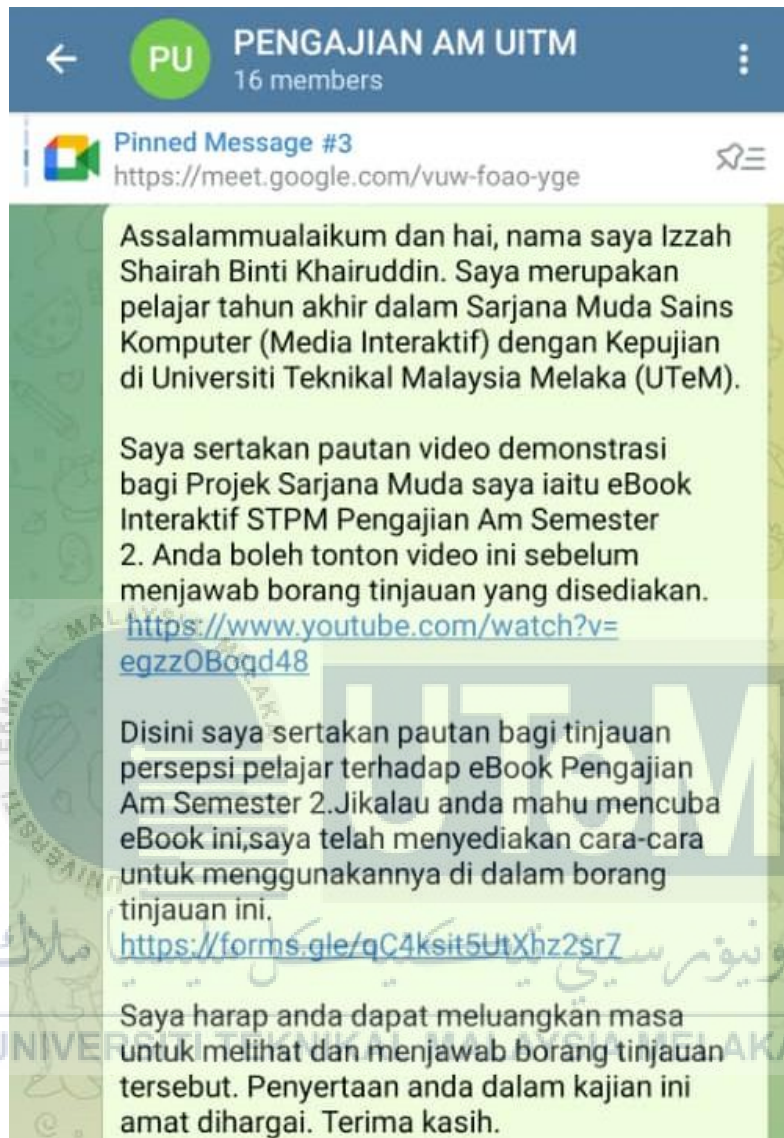
A. Screenshot of user tester

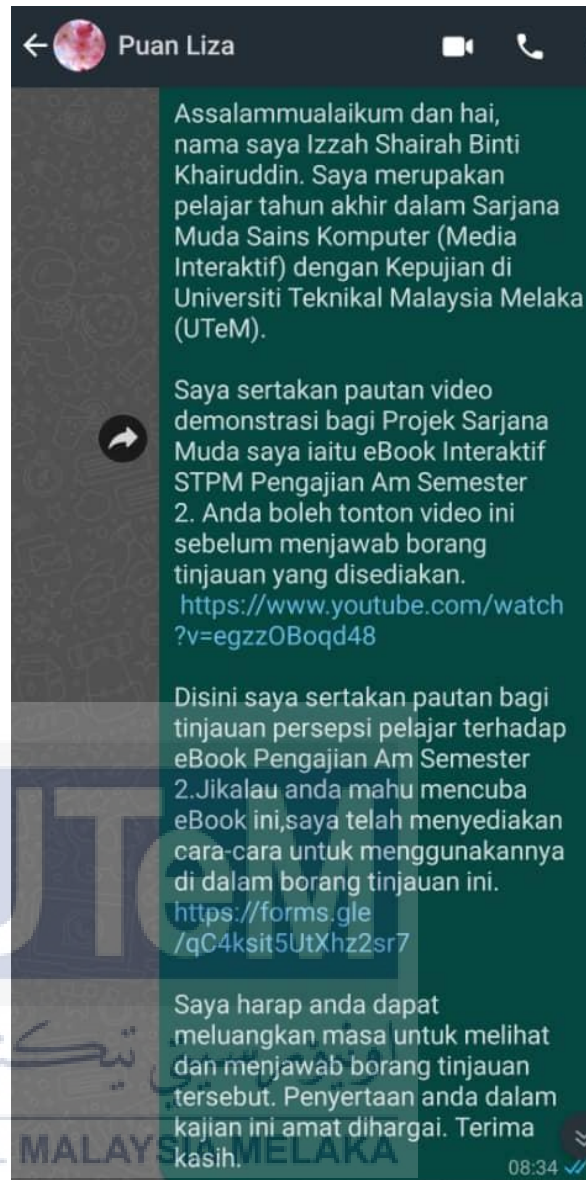
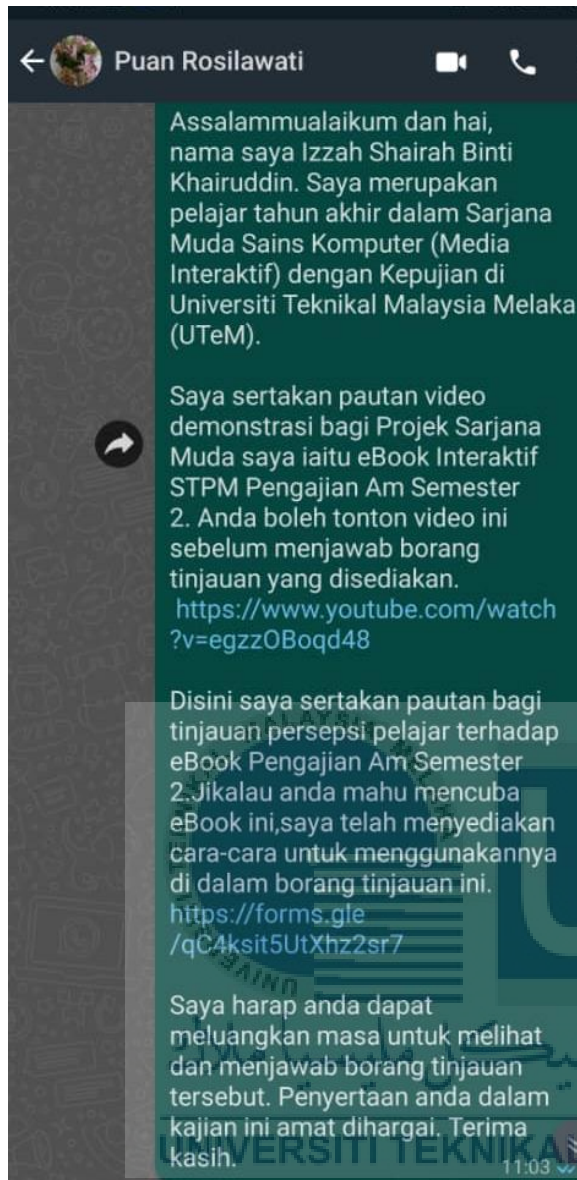
i. Experts





ii. Target user (Students)





B. Questionnaire

i. For Experts

The image shows two screenshots of a Google Forms questionnaire. The top screenshot displays the form's header with the UTeM logo and title, the respondent's email address, and the introductory text. The bottom screenshot shows the main content of the questionnaire, including a link to an eBook and instructions for opening it on an iOS device.

UTeM
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Persepsi Pakar Terhadap eBook Pengajian Am Semester 2

izzahshairah@gmail.com (not shared) [Switch account](#)

Assalamualaikum dan hai, nama saya Izzah Shairah Binti Khairuddin. Saya merupakan pelajar tahun akhir dalam Sarjana Muda Sains Komputer (Media Interaktif) dengan Keahlian di Universiti Teknikal Malaysia Melaka (UTeM).

Tinjauan ini terbahagi kepada tiga bahagian.
A) Maklumat am
B) Fungsi eBook
C) Komen/Cadangan penambahbaikan

Segala pilihan yang telah dibuat akan disimpan dan dianalisis bagi kegunaan pengukuran keberkesanan pembelajaran Pengajian Am melalui buku interaktif. Saya harap anda dapat meluangkan masa untuk menjawab tinjauan ini dan penyertaan anda dalam kajian ini sangat dihargai. Terima kasih.

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https://drive.google.com/file/d/10rQicynIraUiae2_InRqV9TvSTKDIms/view?usp=sharing

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1. Klik **...** pada atas kanan skrin
2. Klik "Open in"
3. Pilih "Books"



Langkah untuk membuka fail ePUB menggunakan komputer riba untuk Windows

1. Pergi <https://www.kotobee.com/en/products/reader>



Download the Kotobee Reader App

Read interactive ebooks and EPUB files, and access Kotobee's free shared library. Kotobee Reader provides exceptional compatibility for ebooks created using Kotobee Author, and EPUB 3.0 standard. Kotobee Reader is available for download for mobile and desktop devices.



Langkah untuk membuka fail ePUB menggunakan komputer riba untuk Windows

2. Klik 'Download for Windows' dan tetapkan aplikasi.
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4. Buka fail yang sudah dimuat turun, klik 'Open with' dan pilih 'Kotobee Reader App'.

Back

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Persepsi Pakar Terhadap eBook

Pengajian Am Semester 2

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* Required

Bahagian A: Maklumat Am

Peranan *

- Guru
- Pakar Multimedia

Jantina *

- Lelaki
- Perempuan

Adakah anda biasa atau mempunyai pengalaman dengan penggunaan dan pengajaran eBook interaktif? *

- Ya
- Tidak

Back

Next

Clear form

Bahagian B: Fungsi eBook

Skala 1- Sangat Tidak Setuju
Skala 2- Tidak setuju
Skala 3- Setuju
Skala 4- Sangat Setuju

A.Keberkesanan eBook

Saya berpendapat bahawa penggunaan elemen multimedia (gambar, audio, teks, video dan animasi) membantu dalam penyampaian eBook interaktif. *

Sangat Tidak Setuju 1 2 3 4 Sangat Setuju

Saya bersetuju bahawa penggunaan elemen multimedia dapat menyampaikan sukatan pelajaran dengan baik. *

Sangat Tidak Setuju 1 2 3 4 Sangat Setuju

Saya berpendapat bahawa eBook interaktif ini akan memudahkan sesi pembelajaran dan pengajaran. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya bersetuju bahawa eBook interaktif ini mudah difahami dan jelas. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya merasakan eBook interaktif ini dapat menarik minat pengguna untuk menggunakannya sebagai bahan pembelajaran. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju



B.Kebolehgunaan

اونيوز سي تي سي كل باي اياك
Saya dapati nota untuk setiap topik jelas dan mudah difahami. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

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Saya dapati audio dan video jelas dan mudah difahami. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya dapati kuiz dapat digunakan dengan baik *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya dapati pelbagai fungsi eBook interaktif ini disatukan dengan baik. (contoh fungsi: cara melukis graf, bantuan audio bagi nota, soalan kuiz, soalan tahun lalu) *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

C.Reka Bentuk

Saya berpendapat imej yang digunakan adalah bersesuaian dengan kandungan yang disampaikan. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya berpendapat pemilihan warna digunakan adalah bersesuaian dengan reka bentuk eBook interaktif. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya berpendapat reka bentuk eBook interaktif sangat menarik dan mudah difahami. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya dapati tiada reka bentuk yang tidak perlu dan eBook interaktif yang tidak konsisten. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Back

Next

Clear form

Bahagian C: Komen/Cadangan penambahbaikan

Cadangan penambahbaikan
Suggestions for improvement

Your answer

Back

Submit


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ii. For Target User


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Persepsi Pelajar Terhadap eBook Pengajian Am Semester 2

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Tinjauan ini terbahagi kepada tiga bahagian.

- A)Maklumat am
- B)Fungsi eBook
- C)Komen/Cadangan penambahbaikan

Segala pilihan yang telah dibuat akan disimpan dan dianalisis bagi kegunaan pengukuran keberkesanan pembelajaran Pengajian Am melalui buku interaktif. Saya harap anda dapat meluangkan masa untuk menjawab tinjauan ini dan penyertaan anda dalam kajian ini sangat dihargai. Terima kasih.

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eBook STPM Pengajian Am Semester 2 Dalam Format ePUB

Berikut merupakan pautan Google Drive untuk eBook Pengajian Am Semester 2 dalam format ePUB. Buka folder dan cuba gunakan eBook ini sebelum menjawab tinjauan.

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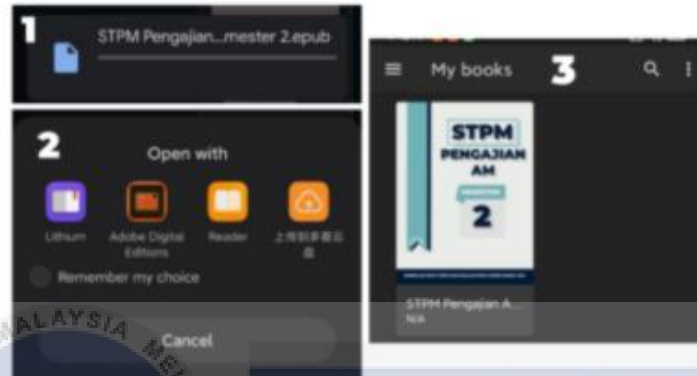
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1. Klik ... pada atas kanan skrin.
2. Klik "Open in"
3. Pilih "Books"



Langkah untuk membuka fail ePUB menggunakan telefon bimbit (Android)

1. Muat turun aplikasi pembaca ePUB di Google PlayStore (Saya menggunakan Lithium. Mana-mana aplikasi pembaca lain juga boleh digunakan)
2. Klik pautan dan muat turun fail.
3. Klik 'Open with 'Lithium'.



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Langkah untuk membuka fail ePUB menggunakan komputer riba (Windows)

1. Pergi <https://www.kotobee.com/en/products/reader>



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Read interactive ebooks and EPUB files, and access Kotobee's free shared library. Kotobee Reader provides exceptional compatibility for ebooks created using Kotobee Author, and EPUB 3.0 standard. Kotobee Reader is available for download for mobile and desktop devices.



Langkah untuk membuka fail ePUB menggunakan komputer riba (Windows)

2. Klik 'Download for Windows' dan tetapkan aplikasi.
3. Pergi ke pautan Google Drive, muat turun fail.
4. Buka fail yang sudah dimuat turun, klik 'Open with' dan pilih 'Kotobee Reader App'.

Back

Next

Clear form

Bahagian A: Maklumat Am

Jantina *

Lelaki

Perempuan

Adakah anda pernah menggunakan eBook bagi subjek STPM Pengajian Am bagi sesi pembelajaran? *

Ya (Yes)

Tidak (No)

Bahagian B: Fungsi eBook

Skala 1- Sangat Tidak Setuju
 Skala 2- Tidak setuju
 Skala 3- Setuju
 Skala 4- Sangat Setuju

Saya mendapati nota bagi setiap topik di dalam eBook interaktif ini mudah difahami dan jelas. * *اويور سيتي بيكيكل*

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Sangat Tidak Setuju 1 2 3 4 Sangat Setuju

Saya dapati penggunaan elemen multimedia (teks, gambar, animasi, audio dan video) di dalam eBook ini adalah bersesuaian *

1 2 3 4

Sangat Tidak Setuju Sangat Setuju

Saya berpendapat bahawa saya memerlukan sokongan orang teknikal untuk menggunakan eBook interaktif ini. *

1 2 3 4

Sangat Tidak Setuju Sangat Setuju

Saya dapati pelbagai fungsi eBook interaktif ini disatukan dengan baik. (contoh fungsi: cara melukis graf, bantuan audio bagi nota, soalan kuiz, soalan tahun lalu) *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Saya merasakan rekabentuk eBook interaktif ini sesuai dan seronok untuk digunakan sebagai bahan pembelajaran. *

	1	2	3	4	
Sangat Tidak Setuju	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sangat Setuju

Adakah anda bersetuju bahawa reka bentuk eBook interaktif menarik dan senang difahami? *

- Ya
- Tidak

Adakah anda bersetuju bahawa nota dan kuiz dalam eBook interaktif ini membantu anda menguji pemahaman anda? *

- Ya
- Tidak

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Adakah anda bersetuju bahawa menggunakan eBook interaktif ini dapat membantu anda memahami dengan lebih mendalam sebelum memasuki kelas? *

- Ya
 Tidak

Adakah anda bersetuju bahawa eBook interaktif ini mudah digunakan? *

- Ya
 Tidak

Adakah anda bersetuju bahawa anda ingin menggunakan eBook interaktif ini secara kerap? *

- Ya
 Tidak

Back

Next

Clear form

Bahagian C: Komen/Cadangan penambahbaikan

Komen/Cadangan penambahbaikan

Your answer

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Report PSM2 Izzah Shairah

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