

**DEVELOPMENT OF INTERACTIVE BOOK FOR MATHEMATICS
SUBJECT YEAR 6**



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF INTERACTIVE BOOK FOR MATHEMATICS SUBJECT
YEAR 6

KHOR KAI XIN



این رپورٹ تیج کی مکمل مالایا
This report is submitted in partial fulfillment of the requirements for the
Bachelor of Computer Science (Interactive Media) with Honours.

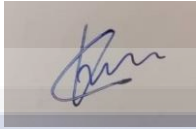
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

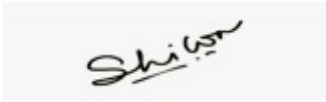
DECLARATION

I hereby declare that this project report entitled
DEVELOPMENT OF INTERACTIVE BOOK FOR MATHEMATICS SUBJECT YEAR 6
 is written by me and is my own effort and that no part has been plagiarized
 without citations.

STUDENT :  _____ Date : _____
 (KHOR KAI XIN)



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 : _____
 (Ass. Prof. Ts. Dr. Hj. Norasiken Bakar)

DEDICATION

I want to express my utmost dedication to my beloved family and my supervisor, Ass. Prof. Ts. Dr. Hjh. Norasiken Bakar who has guided me and motivated me along with the project. Also, this project is dedicated to my evaluator Ts. Syariffanor Hisham who advises to me for this project. Besides, I also dedicated to my faculty, Faculty of Information and Communications Technology, for giving me an opportunity to develop this project. Last but not least, my beloved friends who always support me and encourage me.



ACKNOWLEDGEMENTS

First and foremost, I would express my appreciation to Faculty of Information and Communications Technology in Universiti Teknikal Malaysia Melaka (UTeM) for giving me the opportunity for these 14 weeks of the Final Year Project (FYP).

Besides, I also want thanks to my supervisor, Prof. Madya Ts. Dr. Norasiken Bakar who gave me continuous support and guidance to continue efficiently during my FYP period.

Last but not least, I would like to express my deep and sincere gratitude to my family and friends who have been magnificent support me by giving motivation to me to throughout this project.



ABSTRACT

Nowadays, students need to be having online classes due to the Covid-19. This has caused the problem of misunderstanding between the teachers and the students. Sometimes, students cannot get what the teachers are teaching when having the online classes, and this causes time-consuming to both sides. Moreover, students are hard to focus when having online classes and this makes their understanding of study worst. Especially for the young students like primary school, they are most have the problem of difficulty to focus in front of the screen. This interactive book is a book that has notes with some interactive elements such as video, audio, graphics, and animation that can attract the students' attention, and the most important thing is students can easily understand the learning content through this interactive book. Furthermore, this interactive book has included some quizzes, so that can help the students to refresh what they have learned about the chapter. With these interactivities, students can focus on the study and get it fast. In this thesis, there are 7 chapters have been discussed, introduction of this project, literature review and project methodology that has been used which is ADDIE Model, analysis of the software and hardware requirements, design of the interactive book such as storyboard and interface design, implementation like production of the media, testing for the alpha tester and beta tester and evaluation of the interactive book. The result from the testing phase, we can conclude that this project has hit the goals, which is this interactive book did help the students in learning Mathematics. The limitation during the testing phase is we only can conduct through the online platform because of the pandemic.

ABSTRAK

Pada masa kini, pelajar perlu belajar dalam talian yang disebabkan oleh Covid-19. Hal ini telah menyebabkan muncul masalah perselisihan faham antara guru dan pelajar. Kadang-kadang, pelajar tidak dapat faham apa yang diajar oleh guru semasa waktu kelas dalam talian dan ini telah menyebabkan pembaziran masa kepada kedua-dua belah pihak. Selain itu, pelajar sukar memberi tumpuan semasa belajar di atas talian dan ini telah menjadikan pemahaman mereka terhadap pembelajaran semakin teruk. Terutamanya kepada pelajar yang lebih kecil seperti pelajar di sekolah rendah, kebanyakan pelajar agar sukar untuk fokus di depan skrin. Buku interaktif ini adalah buku yang mengandungi dengan elemen interaktif seperti video, audio, grafik dan animasi yang dapat menarik perhatian pelajar dan yang paling penting adalah pelajar dapat memahami isi pembelajaran dengan lebih mudah melalui buku interaktif ini. Di samping itu, buku interaktif ini juga mengandungi kuiz yang dapat membantu pelajar untuk ingat balik apa yang mereka telah belajar dalam bab-bab tersebut. Seterusnya, melalui buku interaktif ini, pelajar dapat menumpukan perhatian kepada pembelajaran dan faham dengan lebih pantas. Dalam tesis ini, terdapat 7 bab yang telah dibincangkan, pengenalan projek ini, tinjauan literatur dan metodologi projek yang telah digunakan iaitu Model ADDIE, analisis keperluan perisian dan perkakasan, reka bentuk buku interaktif seperti papan cerita dan reka bentuk antara muka, pelaksanaan seperti penghasilan media, pengujian alpha tester dan beta tester dan penilaian buku interaktif. Hasil dari fasa pengujian, kita dapat bahawa projek ini telah mencapai matlamat, yang merupakan buku interaktif ini dapat membantu para pelajar dalam mempelajari Matematik. Batasan semasa fasa pengujian adalah kita hanya dapat melaksanakan melalui platform dalam talian disebabkan wabak Covid-19.

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	XV
LIST OF ATTACHMENTS.....	XVI
CHAPTER 1: INTRODUCTION.....	1
1.1 Introduction.....	1
1.2 Problem Statement.....	2
1.3 Objectives	2

1.4	Scope.....	3
1.4.1	Specific User.....	3
1.4.2	Specific Functionality	3
1.5	Project Significance	3
1.6	Conclusion	3

CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY . 5

2.1	Introduction.....	5
2.2	Domain.....	5
2.3	Existing System	6
2.3.1	Existing Traditional Printed Book of Mathematics	6
2.3.2	Existing PDF notes of subject Mathematics	8
2.3.3	Existing website for learning subject Mathematics	10
2.3.4	Existing video for learning subject Mathematics	10
2.3.5	Comparison of Existing System	12
2.4	Project Methodology.....	12
2.4.1	Phase Analysis	13
2.4.2	Phase Design.....	13
2.4.3	Phase Development	13
2.4.4	Phase Implementation.....	14
2.4.5	Phase Evaluation.....	14
2.5	Project Requirement.....	14
2.5.1	Hardware Requirement	14
2.5.2	Software Requirement	14
2.5.2.1	Software for Development.....	14

2.5.2.2	Software for Documentation.....	15
2.6	Conclusion	15
CHAPTER 3: ANALYSIS.....		16
3.1	Introduction.....	16
3.2	Current Scenario Analysis	16
3.3	Requirement Analysis	16
3.3.1	Project Requirement	17
3.3.1.1	Need Analysis	17
3.3.1.2	User Analysis	17
3.3.1.3	Technical Analysis.....	17
3.3.1.4	Resource Analysis	17
3.3.1.5	Requirement Gathering.....	18
3.3.2	Software Requirement	18
3.3.3	Hardware Requirement.....	18
3.4	Project Schedule and Milestone.....	19
3.5	Conclusion	19
CHAPTER 4: DESIGN		20
4.1	Introduction.....	20
4.2	System Architecture	20
4.3	Preliminary Design	21
4.3.1	Storyboard Design	21
4.4	User Interface Design	22
4.4.1	Navigation Design	27
4.5	Conclusion	28

CHAPTER 5: IMPLEMENTATION	30
5.1 Introduction.....	30
5.2 Media Creation.....	30
5.2.1 Production of Text	30
5.2.2 Production of Graphic.....	31
5.2.3 Production of Animation	31
5.2.4 Production of Video.....	32
5.2.5 Production of Audio	32
5.3 Media Integration.....	33
5.4 Product Configuration Management.....	33
5.4.1 Configuration Environment Setup.....	33
5.5 Implementation Status	35
5.6 Conclusion	35
CHAPTER 6: TESTING	36
6.1 Introduction.....	36
6.2 Test Plan.....	36
6.3.1 Test User	36
6.3.2 Test Environment.....	37
6.3.3 Test Schedule	37
6.3 Test Strategy	37
6.4 Test Implementation	37
6.4.1 Test Description.....	38
6.4.2 Test Data	38
6.4.2.1 Alpha Tester.....	38

6.4.2.2	Beta Tester	42
6.5	Test Result and Analysis.....	44
6.5.1	Alpha Testing Result	44
6.5.2	Beta Testing Result.....	45
6.5.2.1	Result of Pre Test.....	45
6.5.2.2	Result of Post Test	45
6.6	Analysis Testing.....	48
6.7	Conclusion	49
CHAPTER 7: PROJECT CONCLUSION		50
7.1	Introduction.....	50
7.2	Observation on Weakness and Strengths.....	50
7.3	Propositions for Improvement	51
7.4	Project Contribution.....	51
7.5	Conclusion	51
REFERENCES.....		52
APPENDIX A		54
APPENDIX B		56

LIST OF TABLES

	PAGE
Table 1.1: Specific Functionality	3
Table 2.1: Comparison Between Existing System	12
Table 3.1: Software Requirement	18
Table 3.2: Hardware Requirement	19
Table 3.3: Gant Chart Project	19
Table 5.1: Software and Configuration	34
Table 5.2: Implementation Status Project	35
Table 6.1: Test Schedule	37
Table 6.2: Result that has been analyzed	44
Table 6.3: Result Post Test from Control Group	46
Table 6.4: Result Post Test from Experiment Group	47

LIST OF FIGURES

	PAGE
Figure 2.1: Traditional Printed Textbook of Mathematics.....	7
Figure 2.2: Traditional Printed Notebook of Mathematics.....	7
Figure 2.3: PDF Notes for subject Mathematics	9
Figure 2.4: Website of doing quizzed	10
Figure 2.5: Screenshot of Video from YouTube teaching Mathematics	11
Figure 2.6: ADDIE Model	13
Figure 4.1: System Architecture	21
Figure 4.2: Storyboard	22
Figure 4.3: Interactive Book Cover	23
Figure 4.4: Index Page of Interactive Book	23
Figure 4.5: Video Page.....	24
Figure 4.6: Quiz Page.....	24
Figure 4.7: When User Answered Correct	25
Figure 4.8: When User Answered Wrong.....	25
Figure 4.9: Notes pages	26
Figure 4.10: Interactive Solution Explanation Page	26
Figure 4.11: Navigation Chart	27
Figure 5.1: Banshrift Font.....	30
Figure 5.2: Adobe Illustrator CC 2019	31
Figure 5.3: Example Icon that created.....	32
Figure 5.4: Animation setting in Adobe InDesign.....	32
Figure 5.5: Adobe After Effect.....	33
Figure 5.6: Audacity	34
Figure 6.1: Result Pre Test.....	42

Figure 6.2: Result Post Test Group C	43
Figure 6.3: Result Post Test Group E.....	43
Figure 6.4: Pre and Post Test Group C.....	45
Figure 6.5: Pre and Post Test Gorup E	47
Figure 6.6: Post test Control Group and Experiment Group	48
Figure 6.7: Post test Gorup C & E	49



LIST OF ABBREVIATIONS

FYP	Final Year Project
PDF	Portable Document Format



LIST OF ATTACHMENTS

		PAGE
Appendix A	User Interface	54
Appendix B	Testing	56



CHAPTER 1: INTRODUCTION

1.1 Introduction

Coronavirus disease 2019 (Covid-19) pandemic is an infectious disease caused by a newly discovered coronavirus. The COVID-19 virus spreads primarily through droplets of saliva or discharges from the nose when an infected person coughs or sneezes (WHO, 2020). On 16 March 2020, our government has announced the implementation of movement control order (MCO). Kuok Ho Danie Tang (2020) mentioned that implementation in order to keep the social distancing could slow down the spread of the virus. Everyone is required to stay at home and student were having their class at home online.

Ferri, Grifoni and Guzzo (2020) discussed that the online class has many kinds of problems and one of the problems is students hard to understand what the teacher was teaching. Due to the internet access problem of some areas, there are always happened that internet lost connections or lag and this has caused the students cannot receive the complete information from the teachers. Moreover, Umar Abdullahi, Musa Sirajo, Yakubu Saidu and Umar Bello (2020) mentioned that by just reading the static textbook, students cannot understand it easily and hard to focus on it, especially for the subject Mathematics.

Karen Marie Doty (2015) discussed the development of the interactive book can help the students to understands and get what the teacher was teaching because the interactive book includes the multimedia contents such as pictures, videos, and other media that can help the students to understand it. This project also will create exercise

and quiz to help the students to get the knowledge. With the interactive exercise, students will easier understand the knowledge.

1.2 Problem Statement

It has occurred the misunderstanding between the teachers and the students when having the online class. Sometimes, students cannot get what the teachers are talking about when having online classes and teachers need to explain again and again. This is time-consuming to both sides. Moreover, students are hard to focus when having online classes, and their understanding of the study become worst. Especially for the young students like primary school, they are most have the problem of difficulty to focus in front of the screen.

Next, by just reading the static textbook, students totally cannot understand them and have no idea with the steps of working especially is for the subject Mathematics that need to have the steps to solve the question. Although the textbook also included the images and text as be explanation, however, they are hard to understand for the students that age is still young.

1.3 Objectives

- **To design a better content for students**

For this particular reason, with the interactive elements such as graphics, animation and video, students can faster understand the knowledge compare with reading the printed textbook.

- **To develop a better learning tools for student**

A learning tool is very important for the student to achieve the understanding of learning content. A good learning tool can help the student to understand the topics easily with animated examples.

- **To evaluate the easy method for the students**

Able to read anywhere and anytime because the interactive book can access through their mobile phones, tablet and other devices which are very portable.

1.4 Scope

This project scope will focus on two-part, specific user and functionality.

1.4.1 Specific User

This interactive book is developed for year 6 primary school students that taking the subject of Mathematics.

1.4.2 Specific Functionality

This part is explained about the elements multimedia that use in this interactive book. Table below has shown the specific functionality.

Table 1.1 Specific Functionality

Module	Description
Video	User can watch the video that added in this interactive book.
Audio	User can hear the notes of the chapter.
Graphic	User can view the graphic.
Quiz	User can do quizzes to examine their understanding for each chapter.

1.5 Project Significance

In this project, the significance is to the students who are in year 6 in primary school and taking the subject of Mathematics. The interactive book will help the students in understanding the contents of Mathematics with the multimedia elements such as graphics, video, audio, animation and text. Perhaps, this interactive book will capture the students' attention in their learning process with a more attractive way.

1.6 Conclusion

In conclusion, the Interactive book of Subject Mathematics Year 6 Primary School is very useful and convenient for the year primary school students. This interactive book provides multimedia content that can attract the student's attraction

and easily understand how Mathematics worked. Furthermore, this interactive book is a portable book that very easy for the students to bring out, and they can read it everywhere and anytime. It is much lighter than the standard paper books. The next chapter will discuss the literature review and the methodology in this project.



CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

In this chapter will go through the methodology used to develop this project which is ADDIE model. The ADDIE model is a generic approach that training developers and instructional designers have usually used. The five phases are Analysis, Design, Development, Implementation and Evaluation, have represented an innovative and flexible guideline for developing a practical training and performance as support tools.

2.2 Domain

Printed books are books that are mainly composed of pages or pieces of paper that are linked inside the cover. It is a fictional or non-fiction literary work containing facts, stories, poetry, or other comparable material. In other words, a printed book is a long-form literary production that has been published. A book's layout is the format in which a printed book is made out. A front cover, back cover, and body copy or content pages make up the basic layout. The title, subtitle, author name, and publishing house name are all printed on the front cover. Typically, the inner part of the front cover is left blank. The back cover, on the other hand, has the book's ISBN, a photo of the author, and their introduction. It may also include barcode, price and excerpted reviews.

An ebook can be defined as an electronic book that includes images and text in pdf format. In another word, an eBook can be said as an electronic version of a printed book. Based on M. Biñas, P. Štancel, M. Novák and M. Michalko (2012), there are no significant differences between the regular printed book and the eBook except the

ebooks in the digital format example in pdf file. Moreover, it is more portable to bring out, particularly can access through the devices such as a tablet, computer and mobile phones. An interactive book is an eBook that comes with interactive elements. For instance, a standard digital book includes images and text, but for an interactive book, it includes more multimedia elements compared to a normal digital book. The interactive elements can be listed as image, text, video, audio and animation.

An eBook is an electronic version of traditional print books that can be read on electronic devices, example smartphones, laptops and tablets. The eBook has the potential to enhance the audience to absorb the content easily. According to Karen Marie Doty (2015), Interactive eBooks are digital books that in addition to text, may include audio, video, game and animation. This type of content has many contacts where the audience can react to the video, audio, link, and other interactive features. More interactive elements will provide richer experiences and engagement for the readers. According to Mehmet Kesim, Hakan Yıldırım (2017), these portable libraries provide a cost-effective learning technology that enables anytime, anywhere, self-study and interactive study. Besides, the result offered by Şenay Özen Altınkaynak (2019) concluded that the most exciting approach to the phonological and print skills of the children subjected to the interactive book reading method improved more than the other children.

Mathematics is a subject that students compulsory learns in primary school. Based on Umar Abdullahi, Musa Sirajo, Yakubu Saidu and Umar Bello (2020), they said learning Mathematics through the online class is a big challenge for students as a consequence of the inability to communicate between the teachers and the students and students facing the problem of difficulty in solving question Mathematics.

2.3 Existing System

2.3.1 Existing Traditional Printed Book of Mathematics

In the traditional way, students are learning subject Mathematics through the printed textbook and notebooks. Students can try to understand the content through the text and images only. Students need to figure out the solution by just reading the static notes. The figure below shows the printed textbook and notebook.

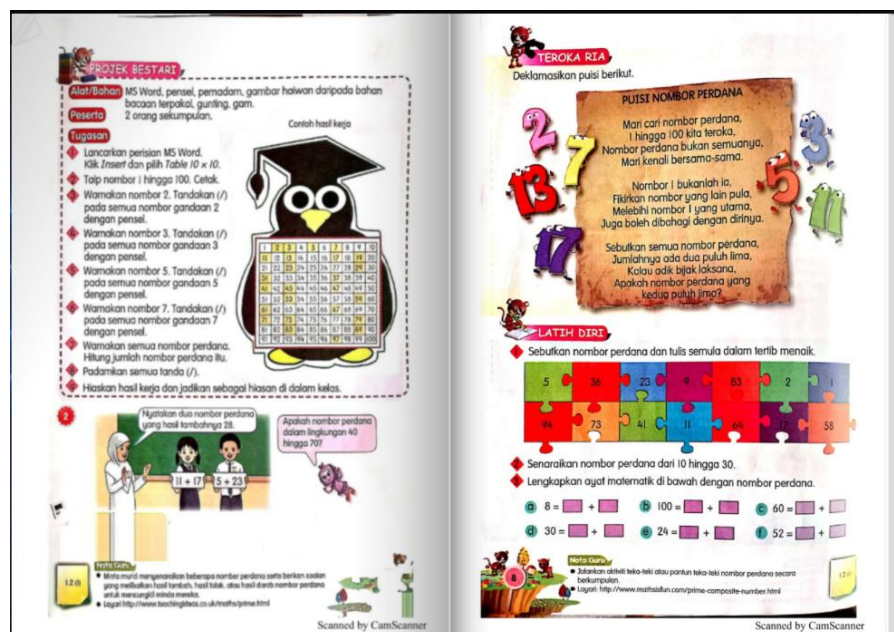


Figure 2.1 Traditional Printed Textbook of Mathematics

(<https://anyflip.com/zdfen/rgow>)

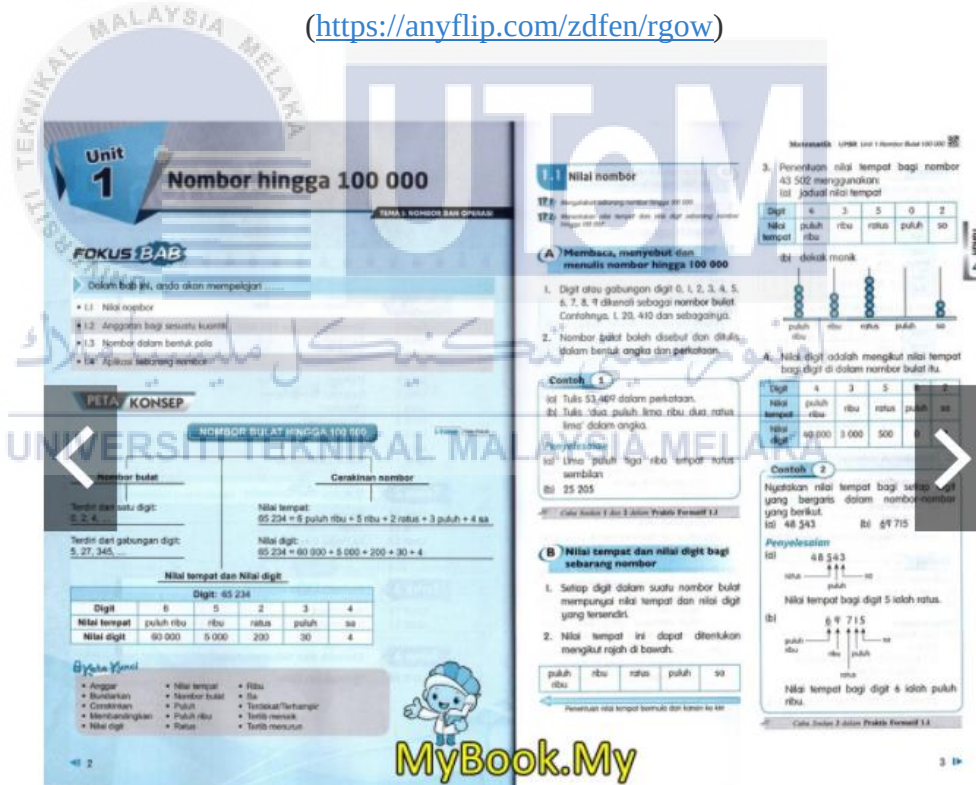


Figure 2.2: Traditional Printed Notebook of Mathematics

([https://shopee.com.my/MyB-Buku-Rujukan-Nota-Focus-Tahun-4.5.6-UPSR-Matematik-\(Pelangi\)-i.27202917.1681636636](https://shopee.com.my/MyB-Buku-Rujukan-Nota-Focus-Tahun-4.5.6-UPSR-Matematik-(Pelangi)-i.27202917.1681636636))

This is the example of a printed textbook and notebook of subject Mathematics primary school year 6. This printed textbook and notebook consists of notes and exercises to help the student to understand Mathematics.

2.3.2 Existing PDF Notes of Subject Mathematics

People have turned the printed Mathematics book into the digital book, which is in PDF. PDF book is the same as the printed book and the notes are created by the text and images. The only different thing with the printed book is it is in the digital and it is lighter than a printed book, so, the students can read it in anywhere and anytime. Figure below has shown that the example of notes in PDF.



PANITIA MATEMATIK SK PEKAN KINARUT
 Penukaran **nombor bulat kepada nombor perpuluhan juta** ialah bahagi dengan 1 000 000 dan pindah titik pepuluhan ke kiri.

Tukarkan setiap yang berikut kepada nombor bulat.

(a) 0.9 juta

(b) 2.056 juta

Penyelesaian

$$(a) 0.9 \text{ juta} = 0.9 \times 1\,000\,000 = 900\,000$$

$$(b) 2.056 \text{ juta} = 2.056 \times 1\,000\,000 = 2\,056\,000$$

Penukaran **nombor perpuluhan juta kepada nombor bulat** ialah dengan $\times 1\,000\,000$ dan pindah titik pepuluhan ke kanan.

Tukarkan 7 300 000 kepada perpuluhan juta.

$$7\,300\,000 = (7\,300\,000 \div 1\,000\,000) \text{ juta}$$

$$= 7.3 \text{ juta}$$

Bagi penukaran pecahan juta kepada nombor dan sebaliknya, hafal jadual pecahan juta di bawah.

Juta	1	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{5}$	$\frac{1}{8}$	$\frac{1}{10}$
Nombor bulat	1 000 000	250 000	500 000	750 000	200 000	125 000	100 000
Perpuluhan	1	0.25 juta	0.5 juta	0.75 juta	0.2 juta	0.125 juta	0.1 juta

Nombor Ganjil Dan Genap

Nombor ganjil ialah nombor yang berbaki apabila dibahagi dengan 2. Nombor ganjil mempunyai digit terakhir 1, 3, 5, 7 atau 9.

Contohnya: 91, 20 197, 3 085, 20 453, 4 519 (lihat di digit sa mesti berakhir dengan **1, 3, 5, 7 atau 9**)

Nombor genap ialah nombor yang tiada berbaki apabila dibahagi dengan 2. Nombor genap mempunyai digit terakhir **0, 2, 4, 6 atau 8**.

Contohnya: 44, 2 098, 3 092, 2 000, 40 506 (lihat di digit sa mesti berakhir dengan **0, 2, 4, 6 atau 8**).

NOMBOR PERDANA

Nombor perdana adalah **nombor asli** yang lebih besar daripada 1, yang faktor pembahagiannya cuma 1 dan bilangan itu sendiri. Sebagai contoh, 2 dan 3 adalah nombor perdana. 4 bukan nombor perdana kerana 4 boleh dibahagi 2. Sepuluh nombor perdana yang pertama ialah 2, 3, 5, 7, 11, 13, 17, 19, 23 dan 29.

Senarai nombor perdana dalam lingkungan 100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Figure 2.3 PDF notes for subject Mathematics

2.3.3 Existing Website for Learning Subject Mathematics

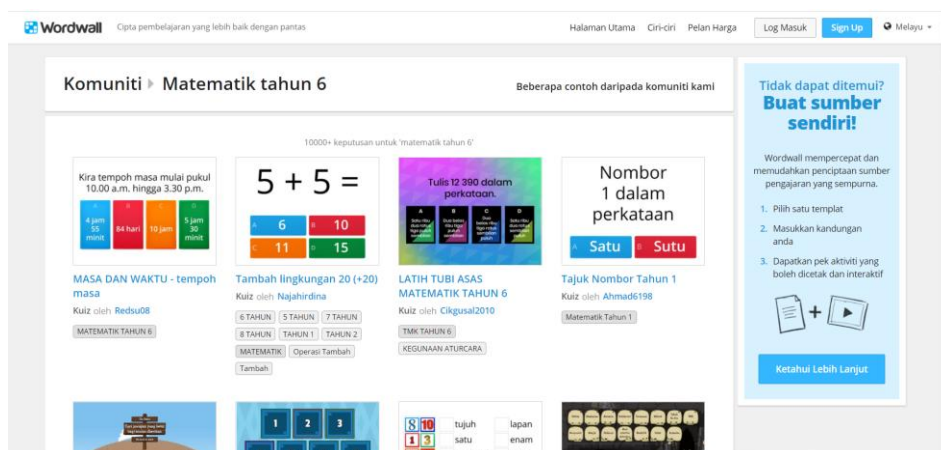


Figure 2.4 Website of doing quizzes

(<https://wordwall.net/ms-my/community/matematik-tahun-6>)

Figure above has shown that the existing websites for the students to do quizzes. On the website, it contains text, audio, images and other multimedia elements. Students will attract to the audio when doing the quizzes.

2.3.4 Existing Video for Learning Subject Mathematics

There are existing videos for the students to learn the subject Mathematics by watching it. The videos are showing the steps to solve the questions Mathematics. It includes animation, audios, and images. Students can watch it online, for example, students can access YouTube to watch the videos. Figure below shows an example of videos that explaining Mathematics.

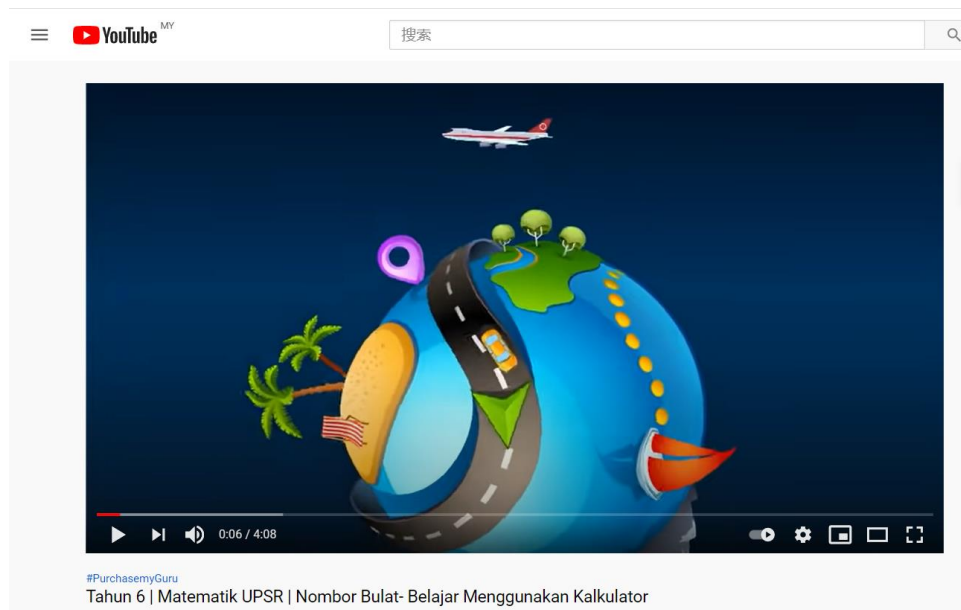


Figure 2.5 Screenshot Video from YouTube teaching Mathematics

(<https://www.youtube.com/watch?v=i4KN1vJ-r0>)



2.3.5 Comparison of Existing System

Table 2.1: Comparison Between Existing System

Book types	Traditional printed textbook and notebook	PDF format Notes	Websites	Videos	Interactive book
Cost	Expensive	Free	Free	Free	Cheap or free
Layout	Static	Static	Dynamic	Static	Dynamic
Storage	Storage space is required.	Need storage in devices	No storage required	No storage required	A device or application can contain many e-books.
Weight	Depends on the volume	Light weight	Light Weight	Light Weight	Light weight
Internet access	No	No	Yes	Yes	Yes/No

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.4 Project Methodology

The ADDIE model is an acronym for the five phases of a development process: Analysis, Design, Development, Implementation, and Evaluation (Eoghan Quigley, 2019). Every stage of the ADDIE model must be performed in the specified order, with a focus on reflection and recurrence. The process creates a focused, streamlined strategy with continuous improvement input.

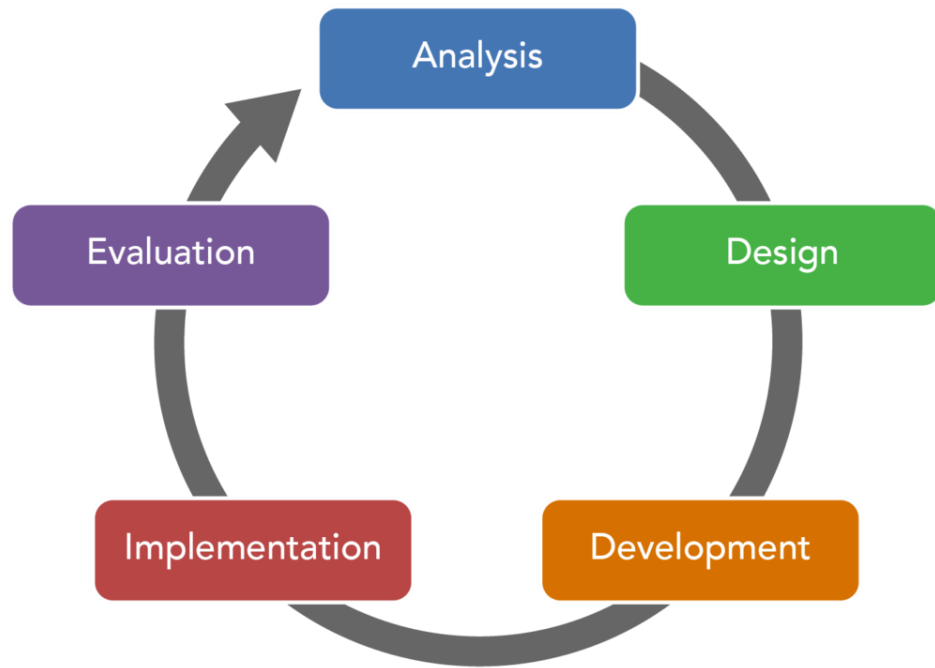


Figure 2.6 ADDIE Model

2.4.1 Phase Analysis

This phase is identifying and clarifying the instructional issue or from a learning perspective, defining the technology gap and intended goals. This phase will be identifying participant features, such as skills and expertise, grade of knowledge, language ability, and inspiration, learning materials, budget, and time restrictions, defining the educational atmosphere, and developing instructional goals and objectives.

2.4.2 Phase Design

This phase comprises general subject matter design, such as setting educational objectives and instructional approaches, as well as material structures and assessments. The design should reflect a logical flow. Assessments should show how far the students has progressed towards the learning goals.

2.4.3 Phase Development

The development phase, as the title implies, includes developing and collecting the specified material in the design phase. This phase contains the stakeholder

evaluation and validation, as well as any necessary adjustments. Technology integration and relevant testing are also included in this phase.

2.4.4 Phase Implementation

The implementation phase contains the training framework, including the course material, learning objectives, and academic environment. Confirming the availability of essential resources and related websites and applications, and also tutoring students on using any appropriate materials or technology, should all be phase.

2.4.5 Phase Evaluation

Despite the fact that evaluation is stated last, it will be used at every stage of operation. That is, the overall design step is designed to be iterative, with elements delicate as required. Interim assessments, also known as formative assessments, are performed prior to deployment to guarantee that the learning materials match the standards outlined in the design phase. After implementation, a summative evaluation would be committed to test the effectiveness of training based on three factors: participant satisfaction, participant learning, and participant performance.

2.5 Project Requirement

2.5.1 Hardware Requirement

The hardware that used in this project is listed below:

- i. Laptop

2.5.2 Software Requirement

There is few software that have used in this project for development and documentation.

2.5.2.1 Software for Development

The software for development that used in this project are listed below:

- i. Adobe InDesign 2021

- ii. Adobe Illustrator CC 2019
- iii. Adobe After Effects 2020
- iv. Adobe Media Encoder 2020
- v. Adobe Photoshop CC 2019
- vi. Audacity

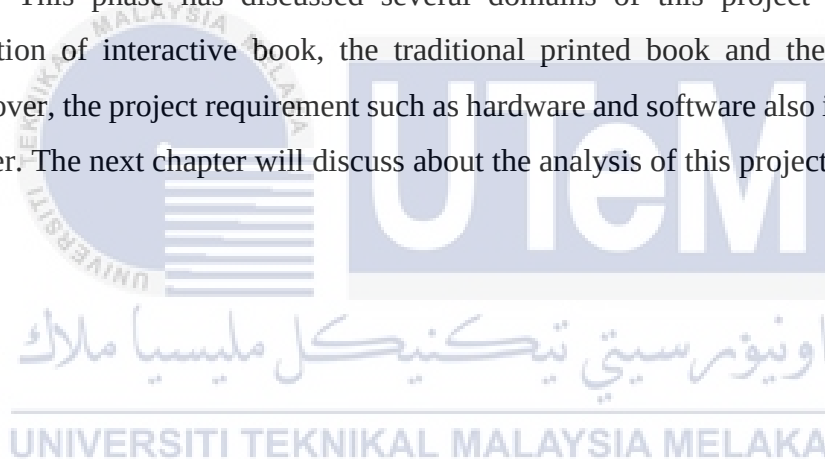
2.5.2.2 Software for Documentation

The software for documentation that used in this project is listed below:

- i. Microsoft Word 2019
- ii. Microsoft PowerPoint 2019

2.6 Conclusion

This phase has discussed several domains of this project which are the definition of interactive book, the traditional printed book and their comparison. Moreover, the project requirement such as hardware and software also included in this chapter. The next chapter will discuss about the analysis of this project.



CHAPTER 3: ANALYSIS

3.1 Introduction

This chapter will go through the project analysis as well as the requirements that are required for it, such as project requirements, hardware, software, and other requirements. Software for development and documentation were included in the software requirements. The analysis stage's goal is to identify and study the elements and structure based on the interpretation. Furthermore, deciding which aspects are more acceptable and how the components are implemented is a crucial stage.

3.2 Current Scenario Analysis

According to the previous chapter, there is an existing system related to this project, which is a traditional printed book, which will be examined in this phase. A traditional printed book is a book that made by sheets of paper which contains elements such as text, images and graphs. In a conventional printed book, also consists of the exercise for the students to consolidate their knowledge.

3.3 Requirement Analysis

The information, functional, and behavioral domains of a problem are the focus of analysis. Before moving on to the next phase, it's critical to identify needs to avoid issues such as not being able to match user expectations or having an unreliable system that's prone to failures. This phase will discuss the details of the project' requirements, including software and hardware. The project's requirements analysis is divided into a few sub-requirements, need analysis, user analysis, technical analysis, resource analysis and requirement gathering.

3.3.1 Project Requirement

3.3.1.1 Need Analysis

The current issue that faced by the students and teachers is most of the time is having online classes and everything like teaching and learning need to go through by online platform. This cause that students hard to understand what the teacher was teaching with the problem of internet connection, unclear explanations in the online meeting and other reasons. In other side, students want to study by themselves with reading the traditional printed book that contains the static image and text, make student harder to understand and soon will get bored and losing their interest of studying.

3.3.1.2 User Analysis

The target user of this project is year 6 primary school students who learn the subject of Mathematics. As a result, this project can to encourage the students to use technology for the betterment. Furthermore, the students are more attracted to something modern and impressive, particularly in technology. As a result, they can gain advantages for the proper advancement of technology.

3.3.1.3 Technical Analysis

The main software in developing this project is Adobe InDesign 2021. Besides, the multimedia elements in this interactive book are designed by Adobe Illustrator CC 2019. The multimedia elements included the text, graphics, video and simple animation.

3.3.1.4 Resource Analysis

The purpose of this resource analysis is to determine the content of the interactive book's available resources. The developer will identify the features relying on the material of the website textbook Mathematics. Mathematics textbook in year 6 primary school was used as a reference source in this project. This reference book provides all the step-by-step instructions or tutorials about Mathematics.

3.3.1.5 Requirement Gathering

The requirement gathering process is one of the vital processes in developing a project. This process is to ensure the developer has effectively hit the project objectives. The requirements that have been gathering, give the developer an ultimate vision in the project development. There is a wide range of methods that can be done in this process, including interview, questionnaire, prototyping and so on.

In this project, the method that used for the requirement gathering is to interview a student who in year 6 of primary school and taking the subject of Mathematics. The interview session is asking the student about the problem that has faced during the Mathematics online classes. Through this interview, the requirements are gathered and reviewed to the existing system, can make improvements to the new product.

3.3.2 Software Requirement

In development process of this interactive book, there are few of software are used to complete the development. The software listed in the table below.

Table 3.1 Software Requirement

Software	Function
Adobe InDesign 2021	To create the interactive book.
Adobe Illustrator CC 2019	To create the graphical content.
Adobe After Effects 2020	To create the videos.
Adobe Media Encoder 2020	To export the videos.
Adobe Photoshop CC 2019	To edit images.
Audacity	To edit the music and audio.
Microsoft Word 2019	Documentation of this project.
Microsoft PowerPoint 2019	To create slide for the presentation.

3.5 Conclusion

This phase has discussed all the requirements and analyses that consist in the analysis phase of this project. Besides, this chapter also shows the Gant Chart of this project. The next chapter will discuss the design of this project which is the preliminary design of the interactive book.



CHAPTER 4: DESIGN

4.1 Introduction

This chapter will go through the activity that in the design phase of the project that is the analysis of the preliminary design. Design of the project is the main thing that can attract the user to continue reading the interactive book.

4.2 System Architecture

The system architecture is a conceptual dependency model that describes the system's structure and other aspects of the system. An architecture definition has represented a system in a way that enables reasoning for the system's facilities and system's behavior. This part will discuss the flow of the system architecture of this project. Figure below shows the flow of the system architecture of this project.

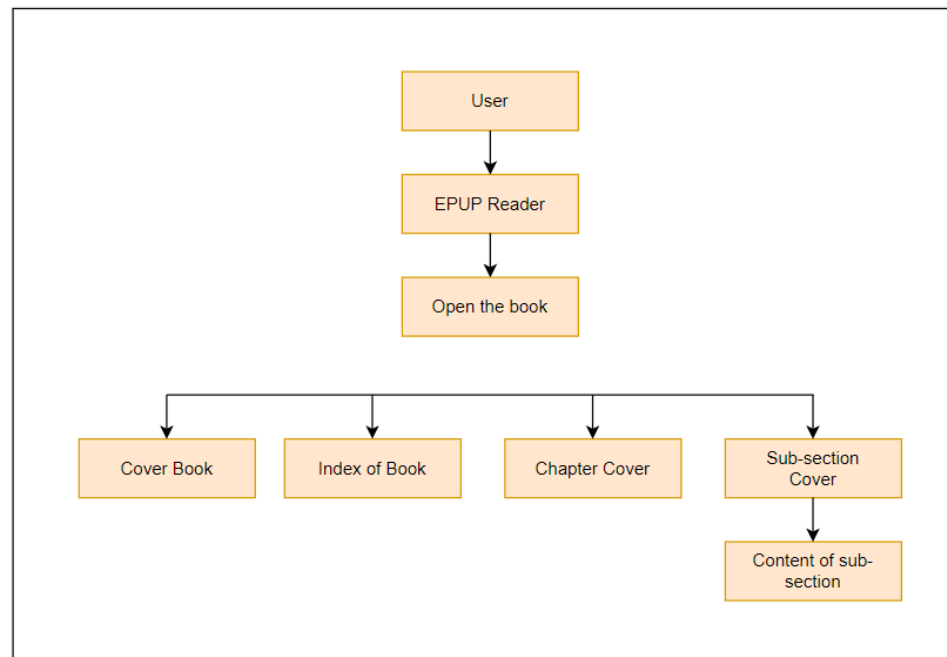


Figure 4.1 System Architecture

4.3 Preliminary Design

Preliminary Design is that part of the design phase in which all the multimedia elements, including a preliminary estimate of the rough design of the project before documented the idea as input to the development phase. The user interface design is a pretty necessary action that the developer needs to take before starting the process of development, and the implementation of interface design and storyboard explanation.

4.3.1 Storyboard Design

Storyboard design is a draft of the design. Before starting to develop a project, a storyboard must be designed first so that the developers can have a mindset about the design of the project. Using the storyboard, the developer can specify the implementation of the design and be a platform to deliver the message to the user. So, before starting to develop this interactive book, early preparation is to design a storyboard to have a structure of the book.

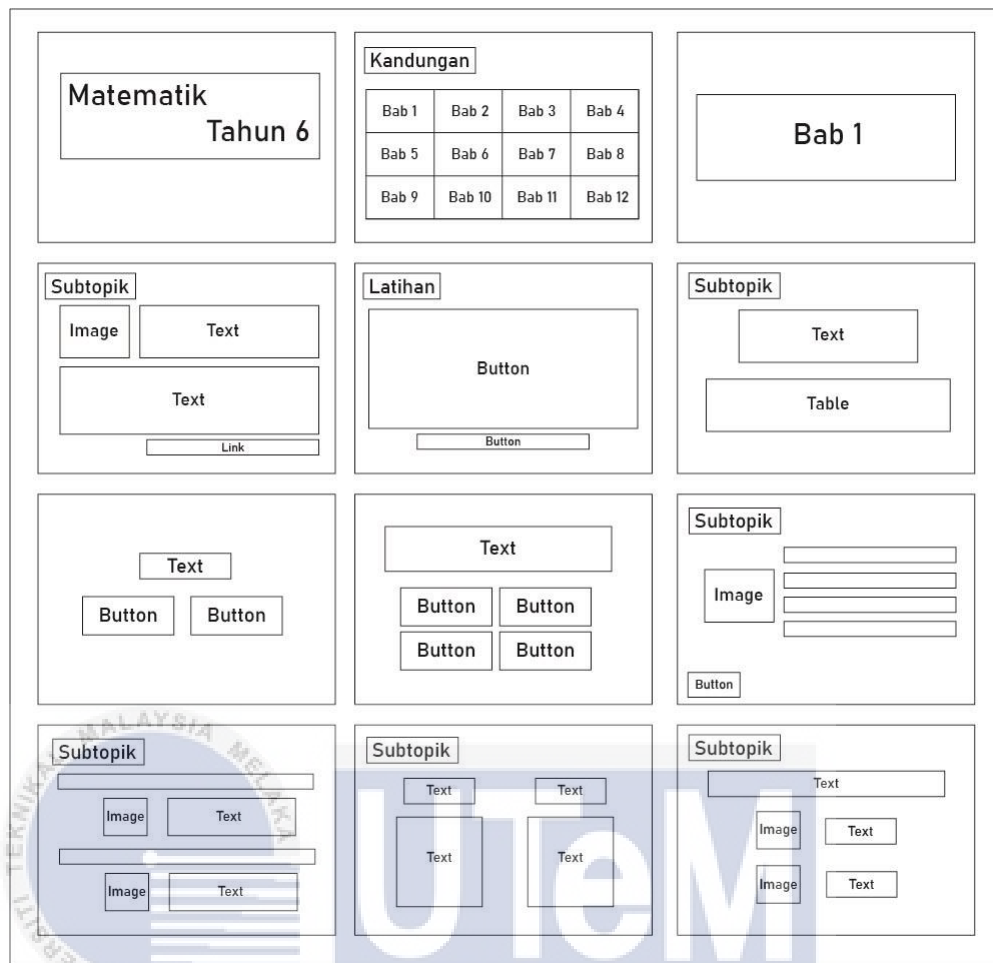


Figure 4.2 Storyboard

4.4 User Interface Design

User interface design is a design that includes the visual element such as text and images to attract the user's attention. Figure 4.3 is the cover page design for this interactive book. The graphic is created and draw by using the Adobe Illustrator CC 2019.



Figure 4.3 Interactive Book Cover

Figure 4.4 shows the index page of this interactive book. User can choose the chapter that wants to go by clicking at the button.

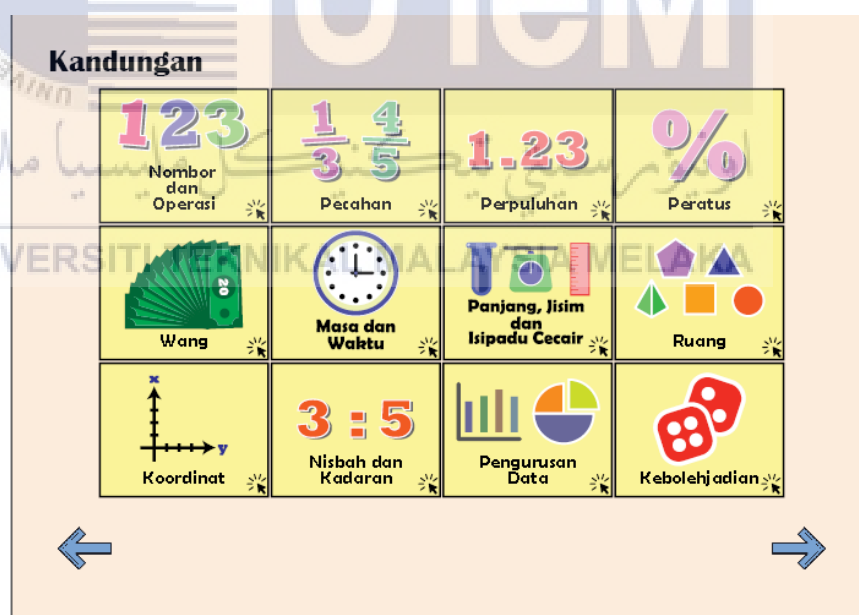


Figure 4.4 Index page of Interactive Book

Figure 4.5 is showing the page for the video. Users can click to play and stop the video by clicking on the buttons. Besides, the users also can click the button to the previous page and next page.



Figure 4.5 Video page

Figure 4.6 is the figure that shows the page of the quiz. On the page, the user can do a quiz by clicking on the button. Figure 4.7 is showing the design if user answered correct, the button would become green. Figure 4.8 shows if the user answered wrong, then the button will become red. Besides, there will be sound effects after the user answered the question.

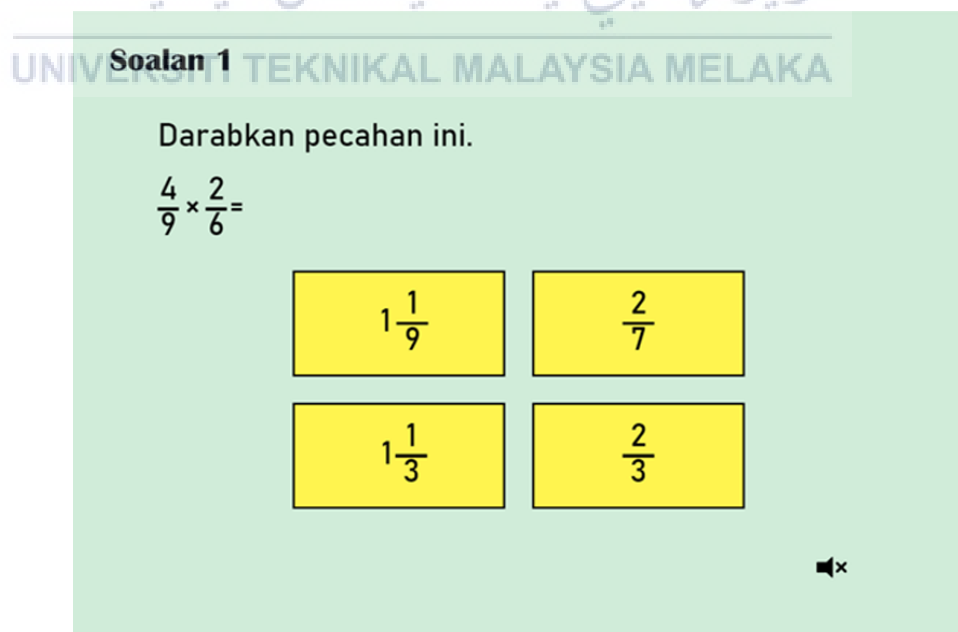


Figure 4.6 Quiz page

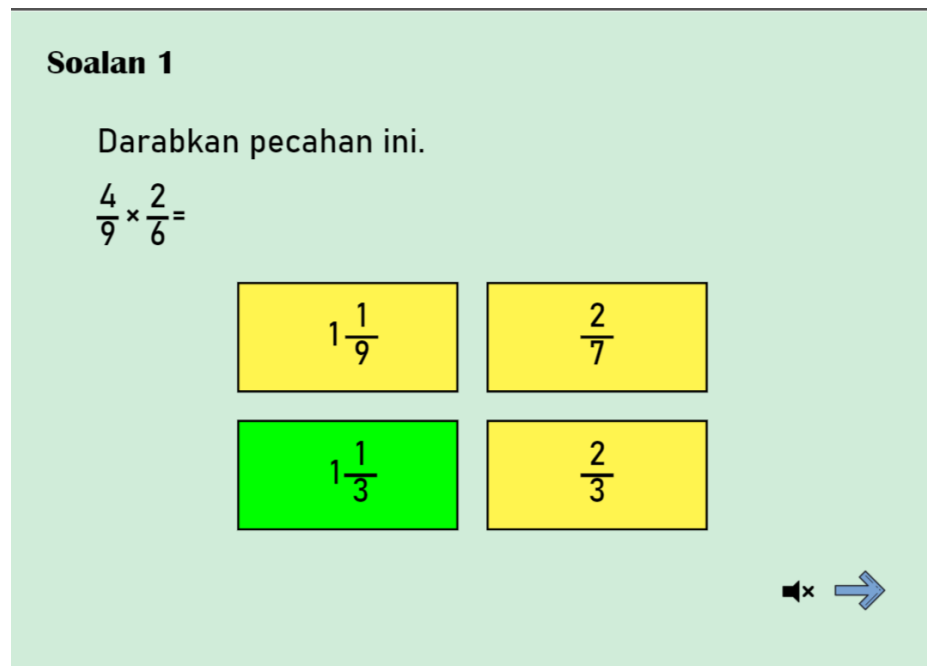


Figure 4.7 When user answered correct

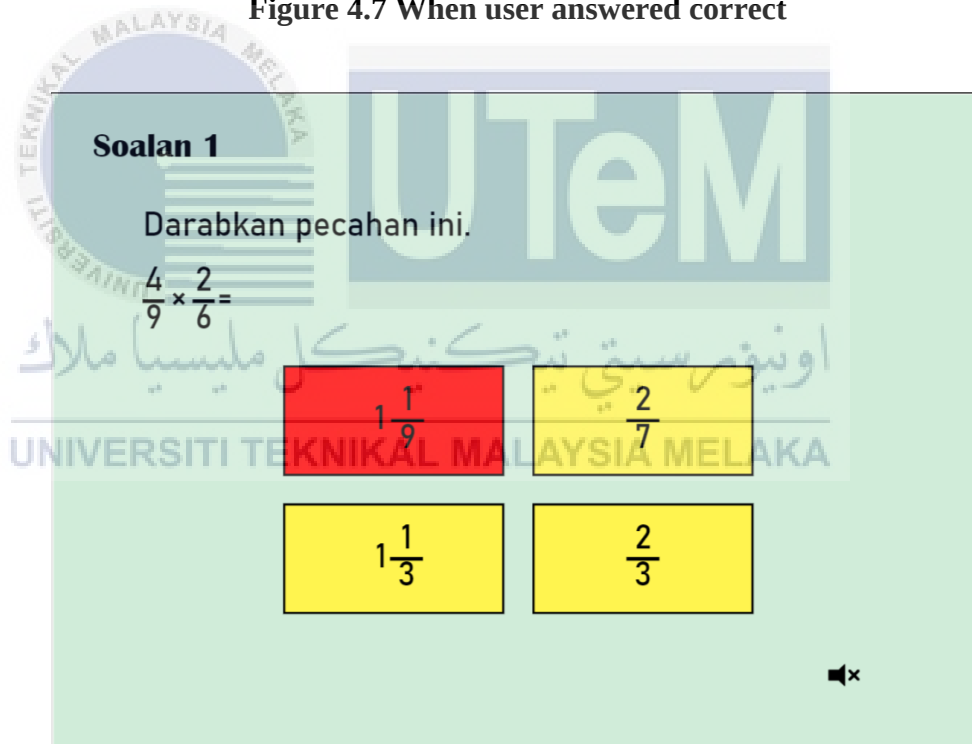


Figure 4.8 When user answered wrong

Figure 4.9 shows that page of notes that consists of the audio. Users can click on the button to hear the audio of the note.

Hubungan Nombor Perpuluhan Juta dan Pecahan Juta dengan Nombor Bulat

Penukaran **nombor bulat** kepada **nombor perpuluhan juta** ialah **bahagi** dengan **1 000 000** dan pindah titik pepuluhan ke **kiri**. 

Penukaran **nombor perpuluhan juta** kepada **nombor bulat** ialah **darab** dengan **1 000 000** dan pindah titik pepuluhan ke **kanan**. 

Bagi penukaran pecahan juta kepada nombor dan sebaliknya, hafal jadual pecahan juta di bawah.

Juta	1	3/4	1/2	1/4	1/5	1/8	1/10
Nombor Bulat	1 000 000	750 000	500 000	250 000	200 000	125 000	100 000
Perpuluhan	1 Juta	0.75 Juta	0.5 Juta	0.25 Juta	0.2 Juta	0.125 Juta	0.1 Juta

Figure 4.9 Notes page

Figure 4.10 shows that the page of interactive solution explanation for Mathematics question. User can watch the animation of solving the question that created by using the simple animation that provided by Adobe InDesign.

Pengiraan Sistem 24 jam kepada 12 jam

Nilai jam melebihi 12

Contoh : Jam 1921 nilai jam : 19 telah melebihi 12

Langkah 1 : Tolakkan dengan 1200

jam	minit
19	21
- 12	00
07	21

Langkah 2 : Tambah unit pm

Jawapan = 7 : 21 **pm**

Nilai jam kurang 12

Contoh : Jam 0347 nilai jam : 03 kurang 12

Langkah 1 : Tolakkan dengan 0000

jam	minit
03	47
- 00	00
03	47

Langkah 2 : Tambah unit am

Jawapan = 3 : 47 **am**



Figure 4.10 Interactive Solution Explanation Page

4.4.1 Navigation Design

The navigation design will be display by a flowchart. This project is starting with the interactive book cover and index of the book. On the index page, users can choose the chapter of the book that they want to read. Also, the user can return to the index page from the chapter page. On the subtopic page, the user can read the notes with the multimedia elements such as text and graphics. Users can go to the next page by clicking the button to next. After reading the notes, this project will provide some exercise to let the users answer, users can only go to the next once they answered the correct answer and then users have done reading this interactive book. Figure 4.3 below is the flowchart that shows the navigation show of this project from the beginning until the end.

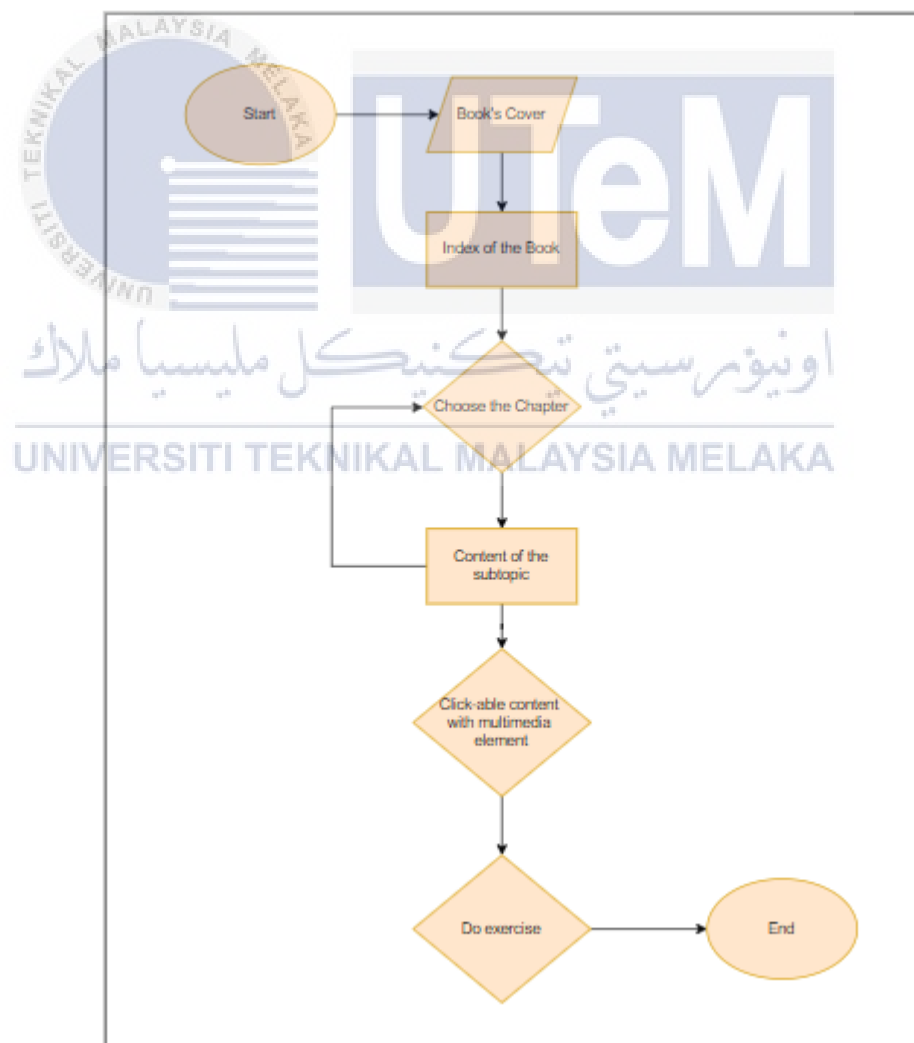


Figure 4.3 Navigation Chart

4.5 Conclusion

This phase has discussed about the all the design in this project. The preliminary design is used to create a rough idea for this project, a storyboard is crated. Moreover, user interface design is used to create the interface for user to interact with the interactive book. The animation, hyperlink, audio and video are added in this interactive book to attract the users' attention. The next chapter will discuss about the implementation of this project which is the media creation and configuration set.



CHAPTER 5: IMPLEMENTATION

5.1 Introduction

This chapter will discuss about the activity that included in the implementation phase of the project. All the process will be explained in this chapter, the multimedia elements that have been used, the configuration environment setup and the progress of the development status.

5.2 Media Creation

This project has included the multimedia elements to attract the user's attention and the elements will discuss below. There are few multimedia elements that have been used in this project such as text, graphic, and animation, video and audio.

5.2.1 Production of Text

Text is a very good way to deliver the information to user. So, in this project, the text has involved the use such as font type, font size and font colors. This will help to attract the attention of the user. The main font that used in this project is Banskchrift font because this font can easily read by the user. Besides, the size of the font that used is 20 to 30pt.

Bahnschrift

Figure 5.1 Banskchrift Font

5.2.2 Production of Graphic

Graphic is an important element of the multimedia because human all is visually oriented. So, in this project, most of the images are created by using the Adobe Illustrator CC 2019.



Figure 5.2 Adobe Illustrator CC 2019



Figure 5.3 Example Icon that created

5.2.3 Production of Animation

Animation can help the viewer to increase their enjoyment and it also can simply to attract the viewer's attention. So, in this project, there are few animations in Adobe InDesign 2020 that has been added such as Bounce, Dance, Fade In and others animation into the graphic and text.

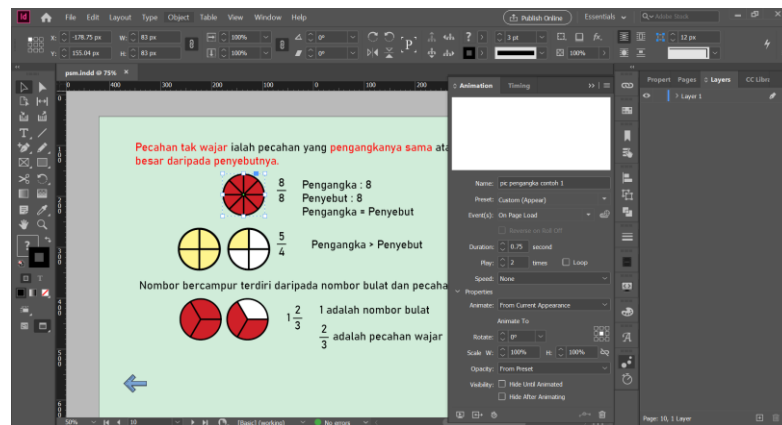


Figure 5.4 Animation setting in Adobe InDesign

5.2.4 Production of Video

In this interactive book, there will consist video as an introduction for each chapter. These videos are edited by Adobe After Effects and the items in the videos such as characters and graphics are created by Adobe Illustrator.

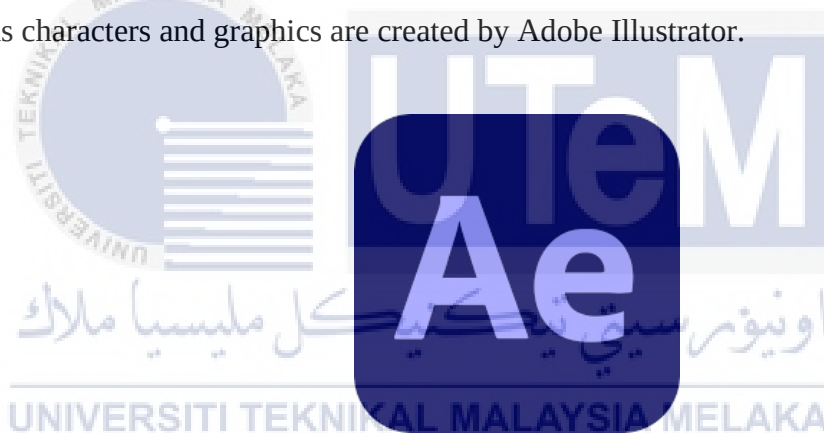


Figure 5.5 Adobe After Effect

5.2.5 Production of Audio

Audio is a multimedia element that can attract user's attention because the audio can make the learning process become fun and interesting. In this interactive book, user can play the audio with the button that created. The audios are edited by using the Audacity.

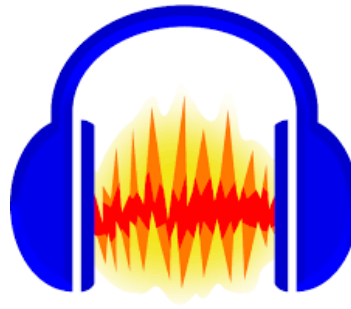


Figure 5.6 Audacity

5.3 Media Integration

The integration of this project is to combine all the multimedia component. All the multimedia elements have been combined by using the Adobe InDesign 2021, all the graphics that have been created is added into the Adobe InDesign as the content. Next, in the Adobe InDesign has added the text and adjust the font type, size and color. After adding the graphic and text, animation has been added in the graphic and text.

5.4 Product Configuration Management

The product configuration management is discussed about the configuration of this project to make sure the project has met the requirements. This included the setting in Adobe InDesign 2021, Adobe Illustrator CC 2019, Adobe After Effect and Audacity.

5.4.1 Configuration Environment Setup

The configuration environment setup for the software in this project. Table 5.1 shows the setup of each software.

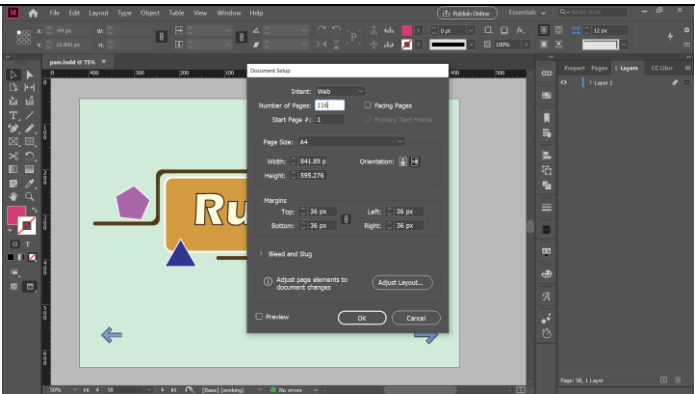
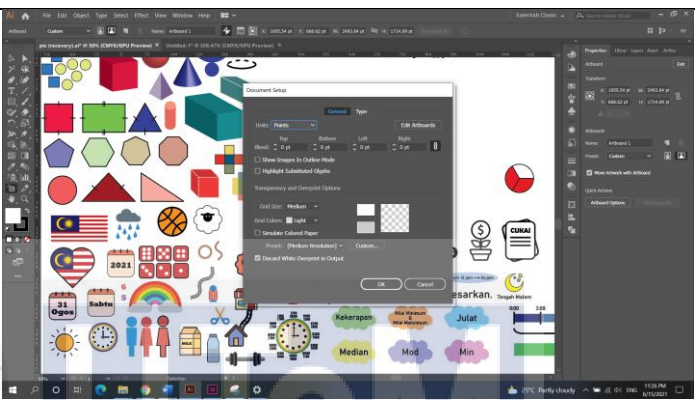
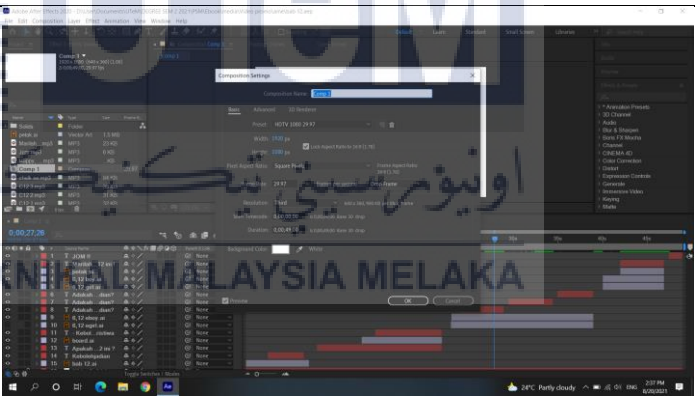
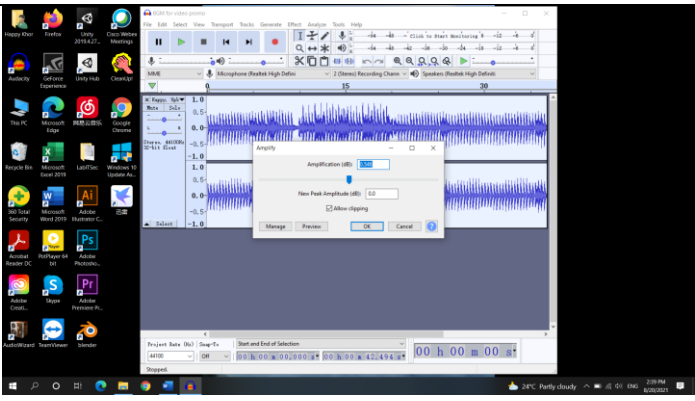
Software	Configuration
Adobe InDesign 2021	
Adobe Illustrator CC 2019	
Adobe After Effect	
Audacity	

Table 5.1 Software and Configuration

5.5 Implementation Status

The implementation status is discussed about the progress of the development status for each phase of the project and it are showed in the Table 5.2. Every module in this interactive book has completed on time such as design storyboard, icons, interface, multimedia elements and the whole interactive book.

Table 5.2 Implementation Status Project

Task	Duration	Status
Design storyboard	2 weeks	On time
Design icon for pages	2 weeks	On time
Design interface for every page	5 weeks	On time
Create multimedia elements	3 weeks	On time
Design the whole interactive book	6 weeks	On time

5.6 Conclusion

This phase has discussed about the all the activity that has been done in the implementation phase of this project. All the production of the multimedia elements and the setup and setting in the software has been discussed. The next chapter will discuss about the testing and evaluation of this project.

CHAPTER 6: TESTING

6.1 Introduction

This chapter is discussing about testing which is to test the successfulness of the project. The result and the activity that in this project will be discussed. In this testing phase, the method of survey has been chosen to conduct to test and collect the data. There are several ideas that in this testing phase such as test plan, test strategy, test implementation and test result and analysis.

6.2 Test Plan

Test plan is an idea to test and evaluate the effectiveness of the new method or tools in teaching and learning Mathematics subject for the year 6 students. So, test plan is the first idea plan in the testing phase of this project.

6.2.1 Test User

In this project, there are two group of testers that have been chosen to test and evaluate the effectiveness of this project which are alpha and beta tester. Alpha tester is the subject matter expert which are the teachers that teaching year 6 Mathematics subject and the multimedia experts. There are two teachers and two multimedia experts have been chosen to evaluate this interactive book. They need to test the project, answer the questionnaire form that has been given and give comment for this interactive book. Beta tester is the students of year 5 in primary school of SJK(C) Yu Chai. 30 respondents from the students are selected in the test. They are required to go through with 2 test, pre test and post test. Pre test is a testing that has be done before the user use the product, post test is the testing that do after they use the product.

6.2.2 Test Environment

In this project, test environment is the place or platform that the testing phase conducted. Due to the pandemic of Covid-19, the test will not be tested by face to face but conducted through the online platform such as Google form, Google meet and WhatsApp. The hardware that need to use in this testing phase is laptop.

6.2.3 Test Schedule

In this project, test schedule is the time that meet with the users. Appointment has been made with the students to test and evaluate the project.

Table 6.1 Test Schedule

Date	Time	Platform
28 August 2021	12 pm	Zoom

6.3 Test Strategy

In this project, there are two type of testing are involved in this testing which are alpha testing and beta testing. Alpha testing is a testing that the experts in multimedia and subject Mathematics to test and evaluate the interactive book. After the experts test the project, the given comment will help the developers a lot in improvement of the project because they are giving the professional feedback. The comments are giving through the questionnaire form.

Beta testing is a testing that the year 5 students to test the interactive book and answer the post test questions. From the data that collected from the correct answer, can analysis it and conclude if the project hit the goals. Beta testing is a very important testing in determination of effectiveness and acceptance of the project.

6.4 Test Implementation

In this project, test implementation is the way of how the testing conducted during the testing stage to the users. Test implementation has included two part which are test description and test data in this testing phase.

6.4.1 Test Description

There are two testing which are alpha testing and beta testing. Alpha testing is the experts giving the feedback by answering the questionnaire form. The questionnaire form for the alpha testing is the questions that more on the design and the content of the interactive book. For example, the design of the interface, video, audio, arrangement of the content and other related question be in the questionnaire form.

Beta testing is the students test the project and do the pre and post test. Pre test and post test for the users are contain 10 questions that related to the subject of the product. The 30 users will do the pre test through the Google form. The result from the pre test will divided them into 2 groups which are control group and experiment group. Control group will go through the way of conversional teaching way which is the traditional printed textbook and experiment group will go through with this product. After that, these 30 students need to do the post test. The result from the pre test and post test will be analysis and evaluate this interactive book. The questions in the pre and post test are established in Google Form are attached in Appendix B section.

6.4.2 Test Data

After completing the testing session, the test data will be collected and evaluated. Determination of meet the goal that stated in the first chapter is the purpose of user acceptance and functionality testing. The result from the test will be collected and analyzed.

6.4.2.1 Alpha tester

The result from the 4 alpha tester is shown at the tables below. There are three type of questionnaire form which is form for the teachers and multimedia expert that have took Mathematics subject before. Each questionnaire consists two section, section A is general information and section b is design of the interactive book.

- i. The result from the teachers.

Section A: General Information

What is your gender?	Male	0
	Female	2
Have you ever used interactive book before?	Yes	0
	No	2
Experience in teaching Mathematics subject.	Below 1 year	0
	1-3 years	0
	4-6 years	0
	7-9 years	1
	Above 10 years	1

Section B: Design of the Interactive Book

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

No	Question	1	2	3	4	5
A	Learnability					
1.	This interactive book can be used without any problems.					2
2.	This interactive book can be controlled from beginning to end.				1	1
3.	The multimedia elements such as audio, video, graphics and animation are attractive and easy for students to learn Mathematics.				2	
4.	This interactive book is suitable for students to learning material.				2	
B	Effectiveness					
1.	The modules in this interactive book is easy to follow and understand.				2	
2.	The modules in this interactive book is easy to follow and understand				1	1
3.	The quizzes contained in this interactive book are appropriate to help students gain knowledge.				2	

C	Ease of Use					
1.	The colors used in this interactive book are appropriate.				2	
2.	The interface design in this interactive book is interesting.				2	
3.	This interactive book is easy to use.					2
4.	Readability of text is clear and easy to understand.					2
5.	Arrangement of icons and navigation buttons are well functions.				1	1
D	Flexibility					
1.	This interactive book is not easy to 'crash'.				1	1
2.	This interactive book is not problematic and not easy to 'hang'				2	
E	Attitude					
1.	This interactive book can attract students' attention.				1	1
2.	This interactive book help students in learning Mathematics subject.				1	1
3.	This interactive book is suitable for the students in learning Mathematics subject.				2	
4.	This interactive book can increase students' interest in learning subject.				2	

ii. The result from the multimedia experts.

Section A: General Information

What is your gender?	Male	0
	Female	2
Have you ever used interactive book before?	Yes	1
	No	1
Experience in this field.	Below 1 year	0
	1-3 years	0
	4-6 years	2
	7-9 years	0
	Above 10 years	0

Section B: Design of the Interactive Book

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

No	Question	1	2	3	4	5
A	Learnability					
1.	This interactive book can be used without any problems.				1	1
2.	This interactive book can be controlled from beginning to end.				1	1
3.	The multimedia elements such as audio, video, graphics and animation are attractive and easy for students to learn Mathematics.				2	
4.	This interactive book is suitable for students to learning material.				2	
B	Effectiveness					
1.	Interactive learning of Mathematics subject using interactive book is very helpful and fun.				2	
2.	This interactive book can help the students to gain knowledge.				1	1
3.	The multimedia elements such as audio, video, animation is accurate and very helpful to students.				1	1
C	Ease of Use					
1.	The colors used in this interactive book are appropriate.					2
2.	The interface design in this interactive book is interesting.				2	
3.	This interactive book is easy to use.					2
4.	The audio and video in this interactive book are clear to hear and easy to understand.				1	1
D	Flexibility					
1.	This interactive book is not easy to 'crash'.				1	1
2.	This interactive book is not problematic and not easy to 'hang'				2	
E	Attitude					

1.	This interactive book can attract students' attention.					2
2.	This interactive book help students in learning Mathematics subject.				1	1
3.	This interactive book is suitable for the students in learning Mathematics subject.				1	1

6.4.2.2 Beta Tester

The result from the beta tester is shown at the table below. There are two type of test, pre test and post test.

- i. Result from the pre test.

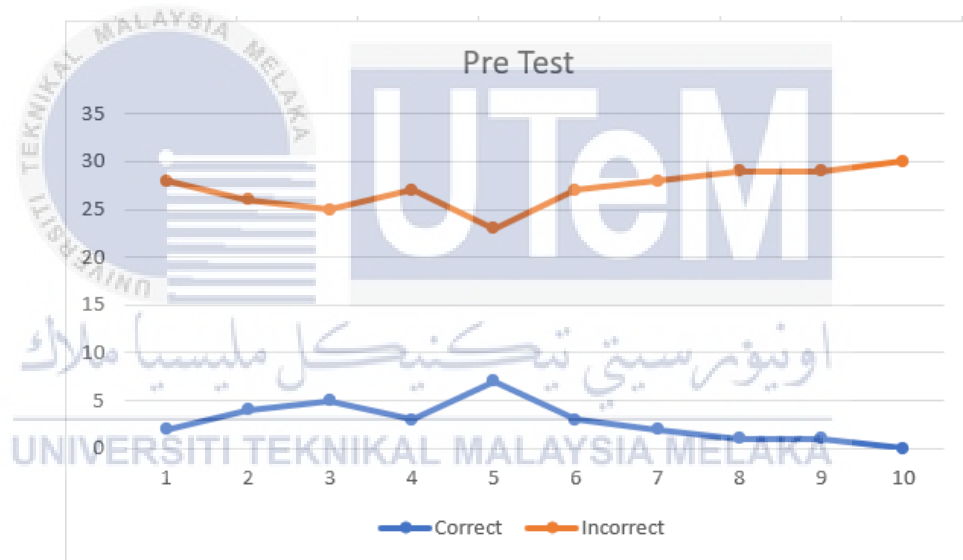


Figure 6.1 Result Pre Test

Figure above shows that the result pre test. There are 10 questions in the pre test, students answered correct the most is the question 5 which is 7 students, and the question students answered incorrect the most is question 10 which is 30 students. From the graph, it can be seen that the question students cannot answered correctly in the pre test.

- ii. Result from the post test that using traditional textbook Mathematics (Control Group)

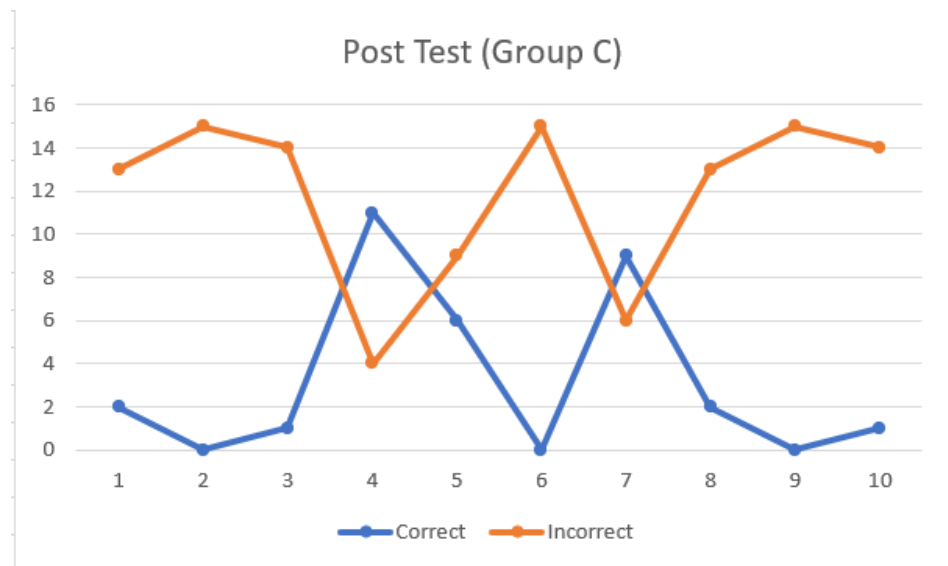


Figure 6.2 Result Post Test Group C

Figure above shows that the result post test from the control group. From the graph we can see that the question students answered correct the most is question 4 which is 11 students, and the question students answered incorrect the most is question 2, 6 and 9 which is 15 students.

- iii. Result from the post test that using interactive book Mathematics (Experiment Group)

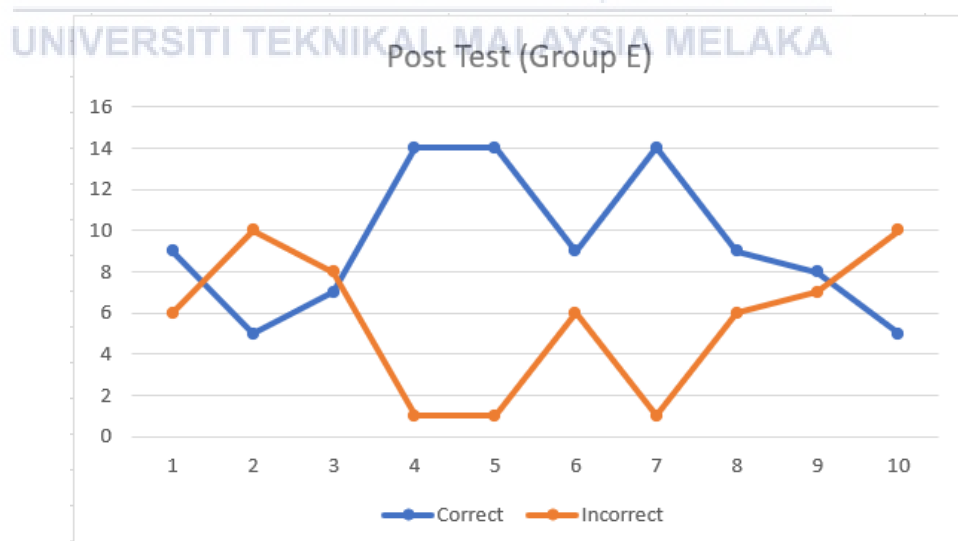


Figure Result Post Test Group E

Figure above shows that the result post test from the experiment group. From the graph we can see that the question students answered correct the most is question 4, 5, 7 which is 14 students, and the question students answered incorrect the most is question 2 and 10 which is 10 students.

6.5 Test Results and Analysis

The table will show the analysis result that collected from the testing phase. The result will be analyzed and evaluate.

6.5.1 Alpha Testing Result

Alpha tester is the subject matter experts which are teachers and multimedia experts. Two multimedia experts and two teachers are the alpha tester. The experts will measure the interactive book from the view of usability and technical aspect. The results are analyzed based on the data that collected from the questionnaire form.

In this testing, two teachers that teaching Mathematics subject were selected. Both are female and never use interactive book before. One of them has 7-9 years' experience in teaching Mathematics subject and one has experience above 10 years. Two multimedia experts were selected to review this project. Both are female and have 4-6 years' experience in multimedia field. One of them never use interactive book and one of them did used interactive book. The table below shows the value reliability Alpha Cronbach from the multimedia experts. The table below shows the result that has been analyzed from data that collected from the teachers and multimedia experts.

Table 6.2 Result that has been analyzed

Constructs	Mean		
	Teachers	Multimedia Experts	Overall
Learnability	4.38	4.25	4.32
Effectiveness	4.17	4.33	4.25
Ease of use	4.5	4.63	4.57
Flexibility	4.25	4.25	4.25
Attitude	4.25	4.67	4.46

Table above shows the result of the 5 constructs of questionnaire for teachers and multimedia experts which are learnability, effectiveness, ease of use, flexibility and attitude. From the mean that got from the data, most of the respondents are agree with the interactive book because all the mean are passed 4.0.

6.5.2 Beta Testing Result

In the beta testing, there are two type of test, pre test and post test. Pre test consists 10 questions and the respondent need to do the test by answer in the google form. After the pre test, the respondents will be divided into two groups, control group and experiment group. The control group will be having the conversional teaching method and the experiment group will using the interactive book.

6.5.2.1 Result of Pre Test

In this testing, 30 students were selected. These 30 students are from SJK(C) Yu Chai. The divided group are attached in the Appendix B.

6.5.2.2 Result of Post Test

i. Control Group

There are 15 students in control group, and they will receive conversional teaching method.

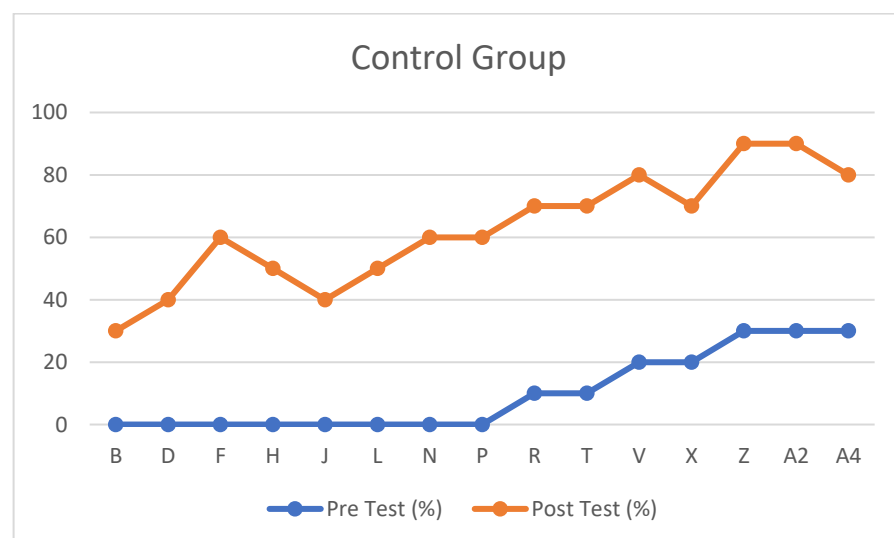


Figure 6.4 Pre and Post Test Group C

Table 6.3 Result Post Test from Control Group

Students	Pre Test (%)	Post Test (%)	Improvement (%)
A	0	0	0
C	0	10	10
E	0	20	20
G	0	10	10
J	0	10	10
K	0	20	20
M	0	20	20
O	0	30	30
Q	0	20	20
S	10	20	10
U	10	40	30
W	20	30	10
Y	30	40	10
A1	30	20	-10
A3	30	30	0
Average	8.67%	21.33%	12.67%

From the table we can see that the students from control group have improvement about 12.67% average after receiving a conversional teaching method. The students in the pre test get the average score of 8.67% and after receive a conversional teaching, they get average score of 21.33%.

ii. Experiment Group

There are 15 students in the experiment group, and they will use this product before answer the post test.

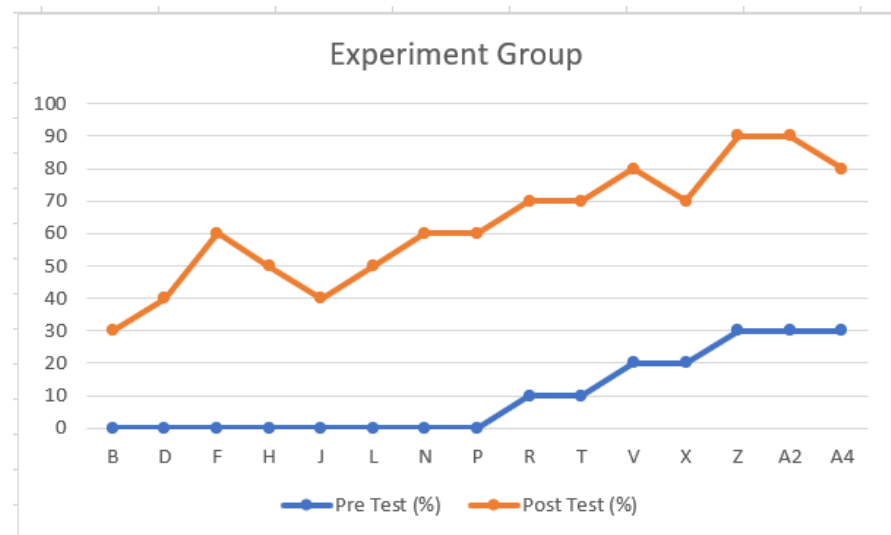


Figure 6.5 Pre and Post Test Group E

Table 6.4 Result Post Test from Experiment Group

Students	Pre Test (%)	Post Test (%)	Improvement (%)
B	0	30	30
D	0	40	40
F	0	60	60
H	0	50	50
J	0	40	40
L	0	50	50
N	0	60	60
P	0	60	60
R	10	70	60
T	10	70	60
V	20	80	60
X	20	70	50
Z	30	90	60
A2	30	90	60
A4	30	80	50
Average	10%	62.67%	52.67 %

The table above shows that the students have achieved about 52.67% of improvement after using this product. The students get average score of 10% in the pre test and get 52.67% of average score in post test.

6.6 Analysis Testing

The completed analysis can ensure that all the objectives of the project is achieved after all the required data have been gathered. The result of the pre test and post test from the 30 students also been analysis.

The improvement of the test by control group and experiment group are 12.67% and 52.67%. This means that this interactive book can help the students in learning Mathematics. The students in control group score 8.67% in pre test and 21.33% in post test, improve 12.67%. The students in experiment group score 10% and 62.67% in post test, improve 52.67%. The higher marks of experiment group proves that this interactive book be a better learning tools for the students to learn Mathematics. The graph below shows that the post test from control group and experiment group.

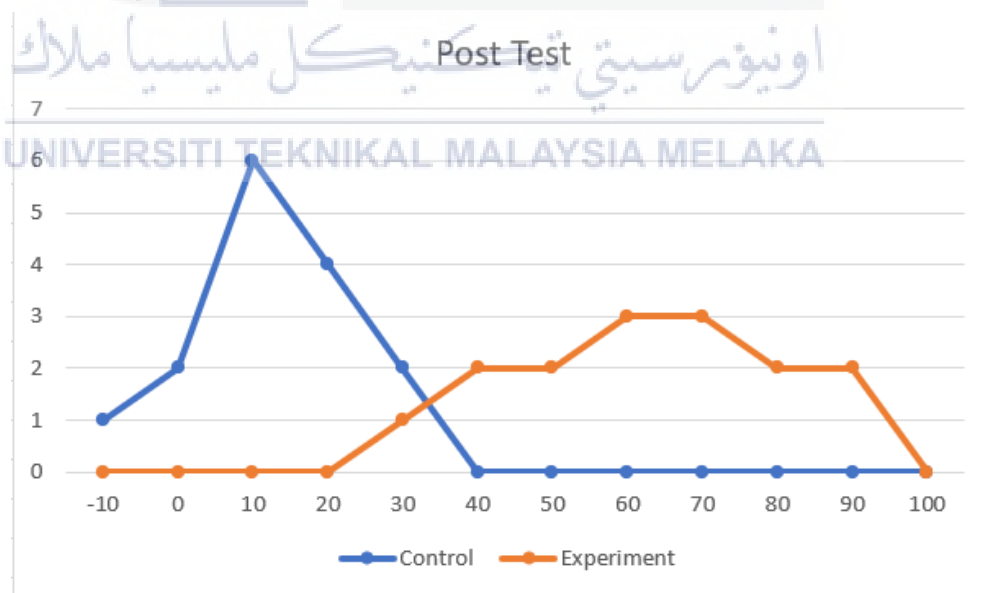


Figure 6.6 Post test Control Group and Experiment Group

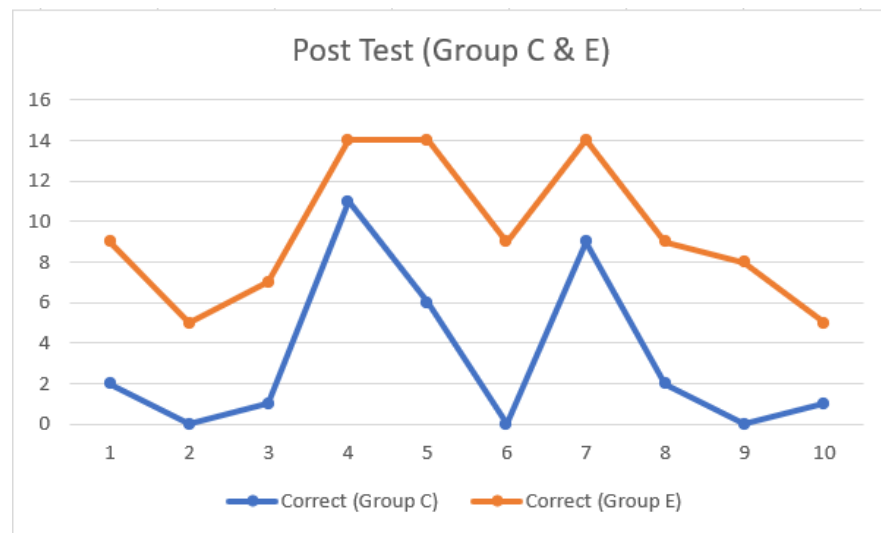


Figure 6.7 Post Test Group C & E

Figure above shows the questions that the students answered. Obviously, the questions that the students in experiment group answered correctly more than the control group.

6.7 Conclusion

This phase has discussed about the all the activity that has been done in the testing phase of this project. In this testing phase consists of alpha testing and beta testing. The user target of alpha testing are teachers and multimedia experts which can give a feedback for the product before going to the beta testing. After done the alpha testing, beta testing is started. The user target of the beta testing is 30 students of year 5 from SJK(c) Yu Chai. They have passed two tests which are pre test and post test. The students will be divided into two groups, control group and experiment group after doing the pre test. Control group will receive a conversional teaching and experiment will use this product. After that, these 30 students will be tested again which is post test. The result is analyzed and can concluded that this product is acceptable as a learning tool. On the next chapter will document the summary for this whole project.

CHAPTER 7: PROJECT CONCLUSION

7.1 Introduction

This chapter will go through the project evaluation as well as the strengths and weakness of the development of interactive book for Mathematics subject year 6. From the previous stage which is testing phase, the weakness and strengths for this product are collected. All the strengths and weakness will be discussed.

7.2 Observation on Weakness and Strengths

There are several weakness and strengths exist in this product to ensure this product can be a better tool in teaching and learning process. Based on the feedback and result that been collected in the testing phase, there are few weakness and strengths.

The strength of this product is can help the students to gain knowledge faster and easier because it contains the multimedia elements such as audio, video, graphic and animation. These multimedia elements can attract the students' attention so that they will feel fun and interesting in learning and will not feel boring to learn. Moreover, this product can be a better tool for the students because it able to read anywhere and anytime. With the interactive elements, students can faster to gain the knowledge compare with reading a traditional printed book.

The weakness of this product is some of the videos inside the interactive book is took from YouTube as reference.

7.3 Propositions for Improvement

The propositions for improvement of this product is the developer can improve that with create more videos and decrease of the using video from YouTube. Besides, developer also need to improve the interface design in the future so that the product can attract more attention from the students. Besides, developer also can add more widgets and elements that related to Mathematics subject.

7.4 Project Contribution

This product definitely can help the students and teachers in learning and teaching as technology nowadays become more advanced. This product can attract the students to learning as there are many interactive elements such as clickable content, audio, and others will make the learning process become fun and interesting. Besides, this electronic book can ease the students because it will not add burden to students, all the need is smartphone, tablet and laptop only.

7.5 Conclusion

This project has met the objectives that listed in the chapter 1, to design a better content for students, to develop a better learning tool for students and to evaluate the easy method for the students.

In conclusion, this project has been achieved the objectives successfully. This development of interactive book for Mathematics subject year 6 can be a new tool and method in learning and teaching process. It makes the learning and teaching process become easier. In addition, the improvement can be made to make this product become more interesting and effective to the students.

REFERENCES

- Abdullahi, U., Sirajo, M., Saidu, Y., & Bello, U. (2020). Stay-At-Home Order and Challenges of Online Learning Mathematics during Covid-19 Case in Nigeria.
- Admin. (2019). *12 muka surat nota ringkas Matematik UPSR Cikgu Nana*. #. <https://www.gpsbestari.com/tip/tip-belajar/12-muka-surat-nota-ringkas-matematik-upsr-cikgu-nana-1.928318>.
- Amir, L. R., Tanti, I., Maharani, D. A., Wimardhani, Y. S., Julia, V., Sulijaya, B., & Puspitawati, R. (2020). Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. BMC Medical Education.
- Best, J. (2021, August). 5 challenges of online teaching (and how to rise above them). 3P Learning.
- Binas, M., Stancel, P., Novak, M., & Michalko, M. (2012). Interactive eBook as a supporting tool for education process. *2012 IEEE 10th International Conference on Emerging ELearning Technologies and Applications (ICETA)*.
- Brilliant eBook publishing ideas, digital book publishing | Flipbuilder.com. (2020). Flip Book Maker for Converting PDF to Flip Book eBook for Digital Magazine Publishing. [FlipBuilder.com].
- Doty, K. M. (2015). Designing for interactive eBooks: an evaluation of effective interaction elements in children's eBooks.
- Ferri, F., Grifoni, P. and Guzzo, T., 2020. Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations. *Societies*, 10(4), p.86.
- Kesim, M., & Yildirim, H. (2017). A Literature Review and Content Analysis On Interactive E-Books. *EDULEARN17 Proceedings*.
- LearnUpon. 2021. ADDIE: 5 Steps To Effective Training Courses | LearnUpon. [online]
- Movement control as an effective measure against Covid-19 spread in Malaysia: an overview. (2020, June 13). PubMed Central (PMC).
- Özen Altınkaynak, Ş. (2019). The Effect of Interactive Book Reading Activities on Children's Print and Phonemic Awareness Skills. *International Journal of Progressive Education*, 15(1), 88–99.
- SAGE Journals. (2020). *Your gateway to world-class research journals*. SAGE Journals.
- S, S. (2020, August 14). *Difference Between Printed Book and eBook (with Comparison Chart)*. Key Differences.

- Tan, C. (2021). The impact of COVID-19 pandemic on student learning performance from the perspectives of community of inquiry. *Corporate Governance: The International Journal of Business in Society*, ahead-of(ahead-of-print).
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55.
- Uis.edu. 2021. Strengths and Weaknesses of Online Learning - ION Professional eLearning Programs - UIS. [online] Available at:
- WHO. (2020, January). *Coronavirus*. World Health Organization.



APPENDIX A: USER INTERFACE

MATEMATIK 6 TAHUN

Arahan Ikon

- Klik untuk mendengar audio.
- Butang yang boleh diklik.
- Sentuhkan ayat.
- Klik untuk membesarkan.
- Klik untuk tutup audio.

Kandungan

123 Nombor dan Operasi	$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ Pecahan	1.23 Perpuluhan	% Peratus
 Wing	 Masa dan Waktu	 Panjang, Jisim dan Hapadan Cecair	 Ruang
 Koordinat	3:5 Hajah dan Kaderon	 Pengurusan Data	 Kebahagian

Nombor Dan Operasi

Bab 1

Nombor Dan Operasi

Nombor Perdana

Apakah itu nombor perdana?

Nombor perdana adalah nombor :

- lebih daripada 1
- hanya dibahagi dengan 1 dan dirinya sendiri.

Klik saya untuk mendengar lagu nombor perdana

Mari kita buat satu latihan. Pilihkan nombor perdana.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Buat Semula

Nombor Tujuh Digit

Nombor

Nilai Tempat Nilai Digit

Contoh Nombor: 3561824

Nombor	3	5	6	1	8	2	4
Nilai tempat	Juta	Ratus ribu	Puluh ribu	Ribu	Ratus	Puluh	Sa
Nilai digit	3 000 000	500 000	60 000	1 000	800	20	4

Hubungan Nombor Perpuluhan Juta dan Pecahan Juta dengan Nombor Bulat

Penukaran nombor bulat kepada nombor perpuluhan juta ialah bahagi dengan 1 000 000 dan pindah titik perpuluhan ke kiri.

Penukaran nombor perpuluhan juta kepada nombor bulat ialah darab dengan 1 000 000 dan pindah titik perpuluhan ke kanan.

Bagi penukaran pecahan juta kepada nombor dan sebaliknya, hafal jadual pecahan juta di bawah.

Juta	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{100}$
Nombor Bulat	1 000 000	500 000	250 000	200 000	125 000	100 000
Perpuluhan	1 Juta	0.75 Juta	0.5 Juta	0.25 Juta	0.125 Juta	0.1 Juta

Pecahan

Pecahan ialah nombor yang mewakili sebahagian daripada kesetruhan.

Pecahan wajar ialah pecahan yang pengangkanya lebih kecil daripada penyebut.

Pengangka : 1
Penyebut : 4
1 ÷ 4 Oleh itu pecahan tersebut adalah pecahan wajar.

Bahagi Pecahan

Bahagi pecahan wajar dengan nombor bulat

- Tukar operasi bahagi kepada operasi darab.
- Nombor bulat ditulis per satu kemudian diturunkan.

Bahagi pecahan wajar dengan pecahan wajar

- Tukar operasi bahagi kepada operasi darab.
- Terbalikkan pecahan berikutnya.
- Darabkan pengangka dengan pengangka, penyebut didarab dengan penyebut.

LATIHAN

Mula Sekarang ! Lain Kali

Soalan 1

Darabkan pecahan ini.

$$\frac{4}{9} \times \frac{2}{6} =$$

$1\frac{1}{9}$	$\frac{2}{7}$
$1\frac{1}{3}$	$\frac{2}{3}$

Darab Perpuluhan

Bagi menentukan empat perpuluhan pada jawapan, jumlahkan tempat perpuluhan bagi dua nombor yang didarabkan.

Contoh : $32.3 \times 1.02 = ?$

$$\begin{array}{r} 32.3 \\ \times 1.02 \\ \hline 646 \\ 3230 \\ \hline 3294.6 \end{array}$$

32.3 mempunyai 1 titik perpuluhan dan 1.02 mempunyai 2 titik perpuluhan, maka jawapan kita akan mempunyai 3 titik perpuluhan. $32.3 \times 1.02 = 32.946$

Peratus

Peratus, pecahan dan perpuluhan adalah saling berkaitan.

Peratus ialah satu pecahan dengan penyebut 100.

Simbol bagi peratus ialah %.

$\frac{1}{4}$	$\frac{3}{4}$	$\frac{75}{100}$	$\frac{1}{2}$	$\frac{50}{100}$	$\frac{25}{100}$	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{10}$	$\frac{1}{100}$
100%	75%	50%	25%	20%	12.5%	10%	5%	4%	

Pecahan kepada Peratus Peratus kepada Pecahan Nombor bulat kepada Peratus Peratus kepada Nombor Bulat Perpuluhan kepada Peratus

Harga kos, Harga jual, Untung dan Rugi

HARGA KOS	HARGA JUAL
UNTUNG	RUGI

Diskaun, Bil, Rebat dan Invois

Diskaun ialah potongan harga daripada harga asal sesuatu barang.

Contoh: Baju RM 28 Diskaun: 10%

Penyelesaian 1 :
Diskaun $\frac{10}{100} \times RM 28 = RM 2.80$
Harga baharu = RM 28 - RM 2.80
Harga baharu = RM 25.20

Penyelesaian 2 :
100% - 10% = 90%
Harga baharu = $\frac{90}{100} \times RM 28$
Harga baharu = RM 25.20

Aset dan Liabiliti, Faedah dan Cukai Perkhidmatan

ASET Harta yang dimiliki. Rumah Wang	LIABILITI Tanggungjawab kesenggan. Hutang
FAEDAH Wang yang diperolehi. Simpanan Bank	CUKAI PERKHIDMATAN Bayaran kepada perkhidmatan. Cukai hotel

Sistem jam

Sistem 12 Jam

Sistem 24 Jam

← YouTube →

Pengiraan Sistem 24 jam kepada 12 jam

Nilai jam melebihi 12

Contoh : Jam 1921

Langkah 1: Tolakkan dengan 1200

jam	minit
1	9
2	1
-	1
2	0
0	7
7	2

Langkah 2: Tambah unit am

Jawapan = 7 : 21 pm

Nilai jam kurang 12

Contoh : Jam 0347

Langkah 1: Tolakkan dengan 0000

jam	minit
0	3
4	7
-	0
0	0
0	3
4	7

Langkah 2: Tambah unit am

Jawapan = 3 : 47 am

← YouTube →

Sistem 12 jam

← YouTube →

Tempoh

- Waktu tamat tolak waktu mula.
- Masa perlu ditukarkan kepada sistem 24 jam.

Contoh 1: Suatu ujian Sains dijalankan selama 2 jam 25 minit. Ujian itu tamat pada pukul 12.10 petang. Pada pukul berapakah ujian itu bermula.

Contoh 2: Pembinaan sebuah dewan mengambil masa 6 bulan 20 hari. Pembinaan itu bermula pada 20 Mac 2021. Bilakah dewan itu akan siap?

Contoh 3: Cari tempoh masa antara 8.45 am dengan 10:30 pm.

← YouTube →

Sistem 24 jam

ditulis dalam 4 digit dan perkataan jam di depan

Contoh : **Jam 16 30**

Sistem 24 jam → 12 jam

Sistem 12 jam → 24 jam

← YouTube →

Ukuran Panjang

Panjang	km	m	cm	mm
---------	----	---	----	----

Contoh: Tukarkan 7.8 km kepada m.

Penyelesaian: 7.81 km = 7 810 m

km → m (× 1 000)

7 8 1 0

← YouTube →

Polygon

Bentuk-bentuk 2D

Bentuk-bentuk 3D

← YouTube →

Kuboid

- 6 permukaan segi empat sama atau tepat
- 12 bilangan sisi
- 8 bilangan bucu
- Isipadu = panjang × lebar × tinggi

Isipadu = 2 × 6 × 3 = 36 cm³

← YouTube →

Jarak antara Koordinat

- Paksi x dikenali sebagai paksi mengufuk.
- Paksi y dikenali sebagai paksi mencancang.
- Koordinat perlu ditulis bermula dengan koordinat x dahulu baru koordinat y.

← YouTube →

Contoh

Cari koordinat titik biru itu.

Jarak titik dari paksi-x = 7 unit

Jarak titik dari paksi-y = 5 unit

Koordinat titik biru itu = (7, 5)

← YouTube →

Nisbah mewakili dua kuantiti

- Nisbah adalah perbandingan antara dua kuantiti yang mempunyai unit ukuran yang sama.
- Nisbah a kepada b ditulis sebagai a:b.
- Nisbah tiada unit.

Contoh:

Nisbah warna oren kepada hijau.

Oren : Hijau

2 : 5

← YouTube →

Perwakilan Data

Diagram showing statistical measures: Kekekapan, Mod, Julat, Min, Median.

← YouTube →

Purata / Min

Hasil yang diperoleh dengan membahagikan jumlah keseluruhan nilai dalam satu set data dengan bilangan data.

Contoh:

Nilai Wang (RM)	1	5	10	20
Bilangan Penyumbang (orang)	2	3	5	4

Jumlah Sumbangan Bilangan Purata Unit

Min = $\frac{(RM 1 \times 2) + (RM 5 \times 3) + (RM 10 \times 5) + (RM 20 \times 4)}{2 + 3 + 5 + 4}$

= $\frac{RM 2 + RM 15 + RM 50 + RM 80}{14}$

= $\frac{RM 147}{14}$

= RM 10.70

← YouTube →

Kebolehjadian Peristiwa

Diagram showing probability levels: Mustahil, Kecil Kemungkinan, Sama Kemungkinan, Besar Kemungkinan, Pasti.

← YouTube →

Besar Kemungkinan

Contoh kemungkinan sesuatu perkara itu berlaku adalah lebih besar.

Hujan akan turun, apabila cuaca mendung.

Cahaya matahari panas di siang hari.

← YouTube →

APPENDIX B: TESTING

- a. Alpha Testing
 - i. Questionnaire for Multimedia Experts

FINAL YEAR PROJECT : DEVELOPMENT OF INTERACTIVE BOOK FOR MATHEMATICS SUBJECT YEAR 6

Hi, I am Khor Kai Xin, a final year student in field of Bachelor of Computer Science (Interactive Media) with Honors at Universiti Teknikal Malaysia Melaka (UTeM).

This is a questionnaire that in order to collect data and evaluate the effectiveness of the new approach in teaching and learning Mathematics subject year 6 students using interactive book. The title of my project is "Development of Interactive Book for Mathematics Subject Year 6".

Covid-19 is an infectious disease caused by newly discovered coronavirus. The infection control and physical distancing measures are helpful in preventing the spread of the virus. So, our government has announced that students are having their class at home through online. However, the online class exists many kinds of problems and one of them is student hard to understand what the teacher teaching. In this case, interactive book can help the students to understands and get what the teacher teaching because interactive book includes the contents such as pictures, videos, and others media that can help student to understand it.

The objective of this project is to design a better content for students with pictures and videos because with the interactive book students can faster to understand the knowledge compare with the textbook. Then to develop a better learning tools for students to easily understand the topics with the video's examples. Then to evaluate the easy method for the students to read anywhere and anytime because interactive book can access through their mobile phones, tablet and other devices which are very portable.

This interactive book is developed for year 6 primary school students that taking the subject of Mathematics. The interactive book contains the interactive contents that students can get the knowledge easily. Through this project, students can easily understand how the Mathematics works with the help of pictures and videos. It is because students can easily get the information through watching the videos or they can watch the videos repeat and repeat until they understand it. In addition, the book that full of media and colorful will attract the students to pay more attention on it, so the students will easily understand how the Mathematics works. Interactive book also is a portable book that very easy for the students to bring out and they can read it anywhere and anytime. It is much lighter than the standard paper books.



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

GENERAL INFORMATION

Direction: Please tick the most appropriate box.

Gender *

☐ Female

☐ Male

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Have you ever used interactive book before? *

☐ Yes

☐ No

Experience in this field. *

☐ Below 1 year

☐ 1-3 years

☐ 4-6 years

☐ 7-9 years

☐ Above 10 years

Learnability

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. This interactive book can be used without any problems. *

1 2 3 4 5

Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

2. This interactive book can be controlled from beginning to end. *

1 2 3 4 5

Strongly Disagree Strongly Agree

3. The multimedia elements such as audio, video, graphics and animation are attractive and easy for students to learn Mathematics. *

Strongly Disagree 1 2 3 4 5 Strongly Agree

4. This interactive book is suitable for students to learning material. *

Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

Ease of use

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. The colors used in this interactive book are appropriate. *

1 2 3 4 5

Strongly Disagree ☐ ☐ ☐ ☐ ☐ Strongly Agree

2. The interface design in this interactive book is interesting. *

Strongly Disagree ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 Strongly Agree

3. This interactive book is easy to use. *

Strongly Disagree 1 2 3 4 5 Strongly Agree

4. The audio and video in this interactive book are clear to hear and easy to understand. *

1 2 3 4 5

Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

Flexibility

Direction: Please rate the following questions according to the following scale:

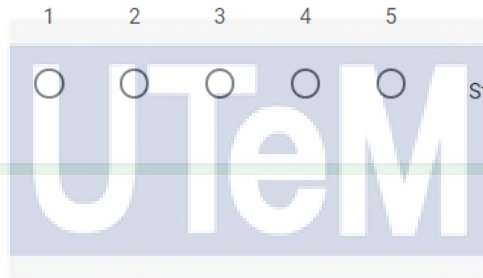
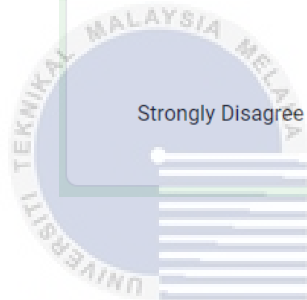
1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. This interactive book is not easy to 'crash'. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

2. This interactive book is not problematic and not easy to 'hang' *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Attitude

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. This interactive book can attract students' attention. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

2. This interactive book help students in learning Mathematics subject. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

3. This interactive book is suitable for the students in learning Mathematics subject. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Comment and Feedback.

Do you have any suggestion or comment for this interactive book? *

您的回答

ii. Questionnaire for Teachers

FINAL YEAR PROJECT : DEVELOPMENT OF INTERACTIVE BOOK FOR MATHEMATICS SUBJECT YEAR 6

Hi, I am Khor Kai Xin, a final year student in field of Bachelor of Computer Science (Interactive Media) with Honors at Universiti Teknikal Malaysia Melaka (UTeM).

This is a questionnaire that in order to collect data and evaluate the effectiveness of the new approach in teaching and learning Mathematics subject year 6 students using interactive book. The title of my project is "Development of Interactive Book for Mathematics Subject Year 6".

Covid-19 is an infectious disease caused by newly discovered coronavirus. The infection control and physical distancing measures are helpful in preventing the spread of the virus. So, our government has announced that students are having their class at home through online. However, the online class exists many kinds of problems and one of them is student hard to understand what the teacher teaching. In this case, interactive book can help the students to understands and get what the teacher teaching because interactive book includes the contents such as pictures, videos, and others media that can help student to understand it.

The objective of this project is to design a better content for students with pictures and videos because with the interactive book students can faster to understand the knowledge compare with the textbook. Then to develop a better learning tools for students to easily understand the topics with the video's examples. Then to evaluate the easy method for the students to read anywhere and anytime because interactive book can access through their mobile phones, tablet and other devices which are very portable.

This interactive book is developed for year 6 primary school students that taking the subject of Mathematics. The interactive book contains the interactive contents that students can get the knowledge easily. Through this project, students can easily understand how the Mathematics works with the help of pictures and videos. It is because students can easily get the information through watching the videos or they can watch the videos repeat and repeat until they understand it. In addition, the book that full of media and colorful will attract the students to pay more attention on it, so the students will easily understand how the Mathematics works. Interactive book also is a portable book that very easy for the students to bring out and they can read it anywhere and anytime. It is much lighter than the standard paper books.



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SECTION A: GENERAL INFORMATION

Direction: Please tick the most appropriate box.

Gender *

☐ Female

☐ Male

اونیورسیتی تکنیکل ملیسیا ملاک

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Have you ever used interactive book before? *

☐ Yes

☐ No

Experience in teaching Mathematics subject. *

☐ Below 1 year

☐ 1-3 years

☐ 4-6 years

☐ 7-9 years

☐ Above 10 years

Learnability

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. This interactive book can be used without any problems. *

1 2 3 4 5

Strongly Disagree ○ ○ ○ ○ Strongly Agree

2. This interactive book can be controlled from beginning to end. *

Strongly Disagree ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 Strongly Agree

3. The multimedia elements such as audio, video, graphics and animation are attractive and easy for students to learn Mathematics. *

اونیورسیتی تیکنیکل ملیسیا

Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

4. This interactive book is suitable for students to learning material. *

1 2 3 4 5

Strongly Disagree Strongly Agree

Effectiveness

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. The modules in this interactive book is easy to follow and understand. *

1 2 3 4 5

Strongly Disagree Strongly Agree

2. This interactive book can be easy to make the students understand the topics.

Strongly Disagree ☐ 1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 Strongly Agree

3. The quizzes contained in this interactive book are appropriate to help students gain knowledge. *

Strongly Disagree ☐ ☐ ☐ ☐ ☐ Strongly Agree

Ease of use

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. The colors used in this interactive book are appropriate. *

1 2 3 4 5

Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

2. The interface design in this interactive book is interesting. *

Strongly Disagree ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 Strongly Agree

3. This interactive book is easy to use. *

Strongly Disagree 1 2 3 4 5 Strongly Agree

4. Readability of text is clear and easy to understand. *

1 2 3 4 5

Strongly Disagree ☐ ☐ ☐ ☐ ☐ Strongly Agree

5. Arrangement of icons and navigation buttons are well functions. *

1 2 3 4 5

Strongly Disagree ○ ○ ○ ○ ○ Strongly Agree

Flexibility

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. This interactive book is not easy to 'crash'. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

2. This interactive book is not problematic and not easy to 'hang' *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Attitude

Direction: Please rate the following questions according to the following scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

1. This interactive book can attract students' attention. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

2. This interactive book help students in learning Mathematics subject. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

3. This interactive book is suitable for the students in learning Mathematics subject. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

4. This interactive book can increase students' interest in learning subject. *

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

Comment and Feedback.

Do you have any suggestion or comment for this interactive book? *

您的回答

b. Beta Testing

i. Meeting with the students



ii. Questions for Pre Test

Soalan Ujian Pra

Ini adalah ujian pra untuk subjek Matematik Tahun 6. Ujian ini mengandungi 10 soalan. Anda diminta jawab semua soalan dan pilih jawapan yang betul. Semoga Berjaya!

k.xin610@gmail.com (未分享) 切换帐号

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Nama *

您的回答

Nombor Telefon

您的回答

Sekolah *

您的回答

Soalan

Pilih jawapan yang betul.

1. Apakah hasil darab bagi 5.09 dengan 43? *

10 分

- ☐ 228.97
- ☐ 219.87
- ☐ 218.87
- ☐ 218.098

2. Pilihkan jawapan yang betul untuk nombor pecahan juta tujuh per sepuluh juta. *

10 分

- ☐ 7/10 juta
- ☐ 7 7/10 juta
- ☐ 10/7 juta
- ☐ 7 1/10 juta

3. $\frac{1}{2} \times \frac{1}{3} =$ *

10 分

- ☐ $\frac{1}{6}$
- ☐ $\frac{2}{6}$
- ☐ $\frac{3}{6}$
- ☐ $\frac{1}{3}$

4. Saiful berbelanja di antara RM 5 hingga RM 8 setiap hari untuk makan tengahari. Berapakah anggaran jumlah perbelanjaan Saiful untuk makan tengahari selama 30 hari. *

10 分

- ☐ RM 130
- ☐ RM 220
- ☐ RM 250
- ☐ RM 270

5. Tukarkan 59% kepada nombor perpuluhan. *

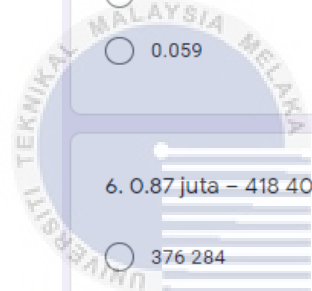
10 分

- ☐ 5.9
- ☐ 59
- ☐ 0.59
- ☐ 0.059

6. $0.87 \text{ juta} - 418\,409 = *$

10 分

- ☐ 376 284
- ☐ 386 127
- ☐ 450 591
- ☐ 451 591



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

7. Rajah di bawah menunjukkan waktu bertolak sebuah bas dari Arau ke Kuala Lumpur pada waktu pagi. Masa perjalanan sebuah bas dari Arau ke Kuala Lumpur ialah 9 jam 45 minit. Bas itu terlewat tiba di Kuala Lumpur 1 jam 15 minit daripada masa perjalanan biasa. Pukul berapa bas itu tiba di Kuala Lumpur? *

10 分



- ☐ Jam 0500
- ☐ Jam 0730
- ☐ Jam 1630
- ☐ Jam 1930

8. Jadual di bawah menunjukkan mata yang diperoleh sekumpulan murid dalam satu permainan. Cari min mata. *

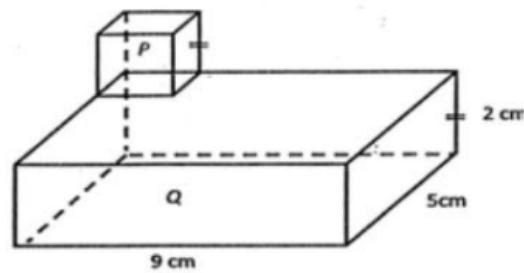
10 分

Mata	2	3	4	5
Bilangan Murid	4	3	1	2

- ☐ 2.1
- ☐ 2.3
- ☐ 3.1
- ☐ 3.3

9. Rajah di bawah menunjukkan sebuah kubus P dan sebuah kuboid Q. Hitungkan jumlah isipadu, dalam cm^3 , seluruh rajah. *

10 分



- ☐ 98
- ☐ 90
- ☐ 88
- ☐ 80

10. Berat bakul yang dibawa oleh Sharon ialah 1 kg 25 g. Dia memasukkan beberapa biji tomato ke dalam bakul itu dan beratnya sekarang ialah 3.7 kg. Berapakah berat dalam g, tomato-tomato itu? *

10 分

- ☐ 1 250
- ☐ 1 620
- ☐ 2 675
- ☐ 2 750

iii. Result Pre Test

Question	Correct	Incorrect
1	2	28
2	4	26
3	5	25
4	3	27
5	7	23
6	3	27
7	2	28
8	1	29
9	1	29
10	0	30

iv. Questions for Post Test

Soalan Ujian Pasca

Ini adalah ujian pasca untuk subjek Matematik Tahun 6. Ujian ini mengandungi 10 soalan. Anda diminta jawab semua soalan dan pilih jawapan yang betul. Semoga Berjaya!

k.xin610@gmail.com (未分享) 切换帐号

اونيورسيتي بيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Nama *

您的回答

Nombor Telefon

您的回答

Sekolah *

您的回答

Soalan

Pilih jawapan yang betul.

1. $0.87 \text{ juta} - 418\,409 = *$

10 分

- ☐ 450 591
- ☐ 376 284
- ☐ 451 591
- ☐ 386 127

2. Jadual di bawah menunjukkan mata yang diperoleh sekumpulan murid dalm satu permainan. Cari min mata. *

10 分

Mata	2	3	4	5
Bilangan Murid	4	3	1	2

- ☐ 3.1
- ☐ 3.3
- ☐ 2.1
- ☐ 2.3

اونيورسيتي تیکنیکل ملیسيا ملاک

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3. Berat bakul yang dibawa oleh Sharon ialah 1 kg 25 g. Dia memasukkan beberapa biji tomato ke dalam bakul itu dan beratnya sekarang ialah 3.7 kg. Berapakah berat dalam g, tomato-tomato itu? *

10 分

- ☐ 2 675
- ☐ 2 750
- ☐ 1 620
- ☐ 1 250

4. Pilihlah jawapan yang betul untuk nombor pecahan juta tujuh per sepuluh juta. *

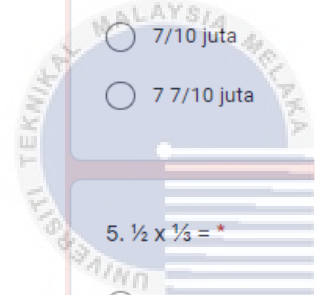
10 分

- ☐ 10/7 juta
- ☐ 7 1/10 juta
- ☐ 7/10 juta
- ☐ 7 7/10 juta

5. $\frac{1}{2} \times \frac{1}{3} =$ *

10 分

- ☐ 2/6
- ☐ $\frac{1}{6}$
- ☐ $\frac{1}{2}$
- ☐ $\frac{2}{3}$



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

6. Saiful berbelanja di antara RM 5 hingga RM 8 setiap hari untuk makan tengahari. Berapakah anggaran jumlah perbelanjaan Saiful untuk makan tengahari selama 30 hari. *

10 分

- ☐ RM 270
- ☐ RM 250
- ☐ RM 220
- ☐ RM 130

7. Tukarkan 59% kepada nombor perpuluhan. *

10 分

- ☐ 0.059
- ☐ 0.59
- ☐ 5.9
- ☐ 59

8. Rajah di bawah menunjukkan waktu bertolak sebuah bas dari Arau ke Kuala Lumpur pada waktu pagi. Masa perjalanan sebuah bas dari Arau ke Kuala Lumpur ialah 9 jam 45 minit. Bas itu terlewat tiba di Kuala Lumpur 1 jam 15 minit daripada masa perjalanan biasa. Pukul berapa bas itu tiba di Kuala Lumpur? *

10 分

اونیورسیتی تکنیکل ملیسیا ملاک

UNIVERSITI TEKNIKAL MALAYSIA MELAKA



- ☐ Jam 1630
- ☐ Jam 1930
- ☐ Jam 0500
- ☐ Jam 0730

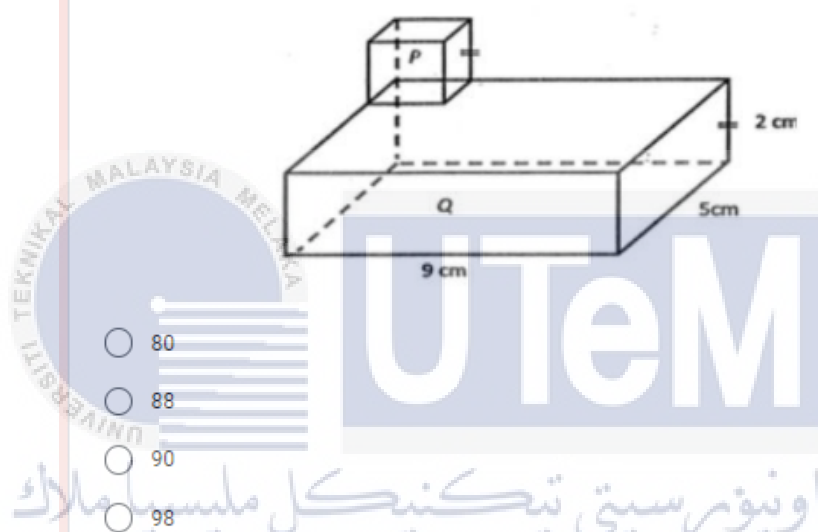
9. Apakah hasil darab bagi 5.09 dengan 43? *

10 分

- ☐ 218.098
- ☐ 218.87
- ☐ 219.87
- ☐ 228.97

10. Rajah di bawah menunjukkan sebuah kubus P dan sebuah kuboid Q. Hitungkan jumlah isipadu, dalam cm^3 , seluruh rajah. *

10 分



- ☐ 80
- ☐ 88
- ☐ 90
- ☐ 98

v. Result Post Test (Group C)

Question	Correct	Incorrect
1	2	13
2	0	15
3	1	14
4	11	4
5	6	9
6	0	15
7	9	6
8	2	13
9	0	15

10	1	14
-----------	----------	-----------

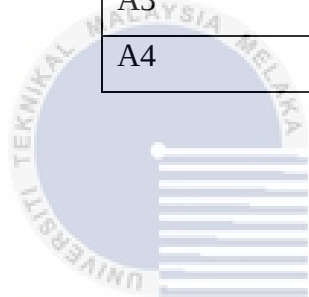
vi. Result Post Test (Group E)

Question	Correct	Incorrect
1	9	6
2	5	10
3	7	8
4	14	1
5	14	1
6	9	6
7	14	1
8	9	6
9	8	7
10	5	10

vii. Students and The Divided Group

Students	Pre Test Score	Divided Group
A	0	C
B	0	E
C	0	C
D	0	E
E	0	C
F	0	E
G	0	C
H	0	E
I	0	C
J	0	E
K	0	C
L	0	E
M	0	C
N	0	E
O	0	C
P	0	E

Q	0	C
R	10	E
S	10	C
T	10	E
U	10	C
V	20	E
W	20	C
X	20	E
Y	30	C
Z	30	E
A1	30	C
A2	30	E
A3	30	C
A4	30	E



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA