Universiti Teknologi MARA
Cawangan Melaka

PCMJ

Progress in Computing and Mathematics Journal

volume 1

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Progress in Computing and Mathematics Journal
College of Computing, Informatics, and Mathematics
Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin
77300, Merlimau, Melaka Bandaraya Bersejarah

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EDITORS

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PREFACE

Welcome to the inaugural volume of the **Progress in Computing and Mathematics Journal (PCMJ)**, a publication proudly presented by the College of Computing, Informatics, and Mathematics at UiTM Cawangan Melaka.

This journal represents a significant step in our commitment to fostering a vibrant research culture, initially providing a crucial platform for our undergraduate students to showcase their intellectual curiosity, dedication to scholarly pursuit, and potential to contribute to the broader academic discourse in the fields of computing and mathematics. However, we envision PCMJ evolving into a beacon for researchers both nationally and internationally. We aspire to cultivate a space where groundbreaking research and innovative ideas converge, fostering collaboration and intellectual exchange among established scholars and emerging talents alike.

The manuscripts featured in this first volume, predominantly authored by our undergraduate students, are a testament to the hard work and dedication of these budding researchers, as well as the guidance and support provided by their faculty mentors. They cover a diverse range of topics, reflecting the breadth and depth of research interests within our college, and set the stage for the high-quality scholarship we aim to attract in future volumes.

As editors, we are honored to have played a role in bringing this journal to fruition. We extend our sincere gratitude to all the authors, reviewers, and members of the editorial board for their invaluable contributions. We also acknowledge the unwavering support of the college administration in making this initiative possible.

We hope that PCMJ will inspire future generations of students and researchers to embrace research and innovation, to push the boundaries of knowledge, and to make their mark on the world of computing and mathematics.

Editors
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TABLE OF CONTENTS

PCMJ

Progress in Computer and Mathematics Journal (PCMJ)
volume 1 [October, 2024]
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TRADITIONAL POETRY OF UPPER SECONDARY STUDENTS VIA MOBILE APPLICATION

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Abstract

Mastering Bahasa Melayu symbolized Malaysian identity, with its unique and beautiful literary works like pantun and gurindam. Traditional Malay poetry, explored through a mobile application, revived interest and understanding among students, preserving cultural treasures. Challenges like the lack of a modern teaching approach, and reliance on traditional methods such as textbooks without a deep understanding, might have prevented student progress. The purpose of this study was to develop traditional poetry of upper secondary students via mobile applications. This application used the ADDIE methodology as it was suitable for mobile application development. In the ADDIE process, Analysis involves assessing the KOMSAS topic for upper secondary students. Design follows, outlining storyboards and flowcharts to determine suitable views. Development then creates instructional materials based on the design. Implementation puts these materials into action, and Evaluation assesses the effectiveness. Since this development was aimed at evaluating mobile usability, the assessment utilized the System Usability Scale. Following tests conducted with 32 participants from schools, the System Usability Scale score for this mobile application, called Sastera Santai, was 83.67%, indicating excellence. Explore possibilities for incorporating additional educational features, enhancing the user experience for a more comprehensive and enriched learning environment.

Keywords: Mobile application; Traditional poetry

INTRODUCTION

Bahasa Melayu needed to be mastered to symbolize identity as a Malaysian. The Malay language has literary works where it had its uniqueness and beauty. In the Malay tradition, the meaning of literature itself reflected the natural beauty of its work (Halim Ali, 2011). Traditional Malay poetry, including *pantun, gurindam, talibun, mantera*, and *teromba*, was part of the beautiful literature that originated from the native Malays. Study by (Saludin, 2013) traditional Malay poetry was in the form of oral poetry and was the oldest branch of Malay

literature ((Noah et al., 2012). Traditional Malay poetry was the radiance of the Malay community. Traditional poetry was different from new poetry, it can be seen through the form of the poem itself, and it can also be seen from the point of rhythm or contained feeling (Saludin, 2013). Furthermore, when talk about poetry, it seems to be talking about a large aspect that contains various mysteries and amazing fantasy because it was like a story (Saludin, 2013).

Malay poetry has been compulsory in Bahasa Melayu and has been exposed to secondary school students since 2002. Presently, in this modern era, many of the young generations might not be interested in this traditional Malay poetry. Based on the study (Noor, N. A. M., et al. 2016) literature language has always been considered a burden for student because the text that has been used was hard to understand it makes the student not excited when learning which make that one of the excuses to neglect learning. Next by using only text to understand the word it makes more boring.

Therefore, this project has implemented a mobile application which mobile application learning was one of the best approaches for students due to mobile devices has become one of the important things in life that they can use anytime and anywhere. In a study by (Karabatzaki et al., 2018) researchers recognized that learning literature in mobile learning can be the motivator for users to learn hence game-based learning. This mobile application can attract more student to learn and understand because it includes a multimedia element such as text, sound, and animation rather than a book that have text only. Furthermore, it was necessary to attract the younger generation's interest to explore into Malay literature so that Malay treasures are not swallowed up by time. This project has been implemented a mobile application that helps students become more interested in learning traditional poetry by learning using mobile devices.

Problem Statement

Lack of understanding of the Malay literature language

The incorporation of the literature component in the Bahasa Melayu syllabus aims to empower the Malay language. Malay literature, which includes traditional poetry *pantun* modern poetry, short stories *cerpen,* and more, has been introduced to secondary school students progressively. It was first introduced in 2000 for Form 1 and 4 students, followed by Form 2 and 5 students in 2001, and Form 3 students in 2002. However, according to (Bujang & Subet, 2022)

traditional poetry, presents a challenge for students due to its classical language usage, which was not commonly used in everyday life. This difficulty in understanding the unique features of classical language has led to decreased interest in Malay Literature among students.

Lack of modern teaching approaches

The purpose of including *KOMSAS* in Malay language education was to attract students' curiosity and deepen their appreciation and understanding of literary works (Mahamod & Hassan, 2018). However, traditional teaching methods in literature often limit student engagement and fail to maximize into their potential. The absence of innovative and interactive strategies prevents students from fully appreciating and understanding the rich literary heritage embedded in *KOMSAS*. A study by (Mahamod & Hassan, 2018) highlights the ineffectiveness and lack of interest resulting from the use of traditional teaching methods in *KOMSAS* instruction. Based on study (Mahamod et al., 2011)many experienced teachers struggle with using technology, making it difficult for them to create multimedia software for teaching. Some Malay language teachers also lack the skills to use technology effectively as a teaching tool. This weakness presents a significant challenge to the integration of multimedia in the teaching and learning process of the Malay literature component in the Malay language subject.

LITERATURE REVIEW

Malay Literature

In traditional societies, literature holds significant importance as a medium of mass communication. It can be classified into two primary forms: oral literature and written literature, each carrying its own different characteristics and modes of transmission (Norizam Jamian & Bahri Md Radzi, 2015). Malay literature refers to literary works produced in the Malay language. Literary works are one of the wonderful and valuable forms of art (Norizam Jamian & Bahri Md Radzi, 2015). Malay literature has a rich and varied history and was still used in this century, with influences from various cultures and traditions.

Other than that, Malay literature started in ancient times ago and it includes a lot of stories such as folk tales. It can be concluded that the Malay community previously owned an intelligent language and a very large capacity for thought. Malay literature is a work that has been created with the beauty that lies in the power of the language to describe a wide image but has been presented in a beautiful and own way. The idea of Malay literature has become

more powerful and more attractive due to its being created with the author's style and imagination (Halim Ali, 2011).

Traditional Malay Poetry

According to a study (Saludin, 2013)when talk about traditional Malay poetry, it was about exploring a wide and fascinating world filled with imaginative stories and enchanting mysteries. Traditional Malay poetry refers to the poetic forms and traditions that have been handed down through many generations in Malay culture. The difference between traditional Malay poetry and other forms of poetry lies in the way they are structured, the specific word used, the rhythmic patterns, and the thoughts and emotions expressed within them. There are a lot of genres of poetry that have been produced such as love, nature, and moral values. Cultural researchers agree that the earliest poetry born in Malay society was *mantera* (Saludin, 2013). Besides *mantera* other traditional Malay poetry includes various forms like *pantun, gurindam, teromba,* and *talibun*.

Poetry has been divided into two categories which are bound poetry and free poetry. The standout forms of traditional Malay poetry, which are commonly found in written form are *gurindam* and *pantun*. According to (Saludin, 2013) some believe that the term *gurindam* originated from the Sanskrit language and entered the Malay language through Tamil, but its content does not follow Sanskrit or Tamil poetry. Instead, it was considered a loan term without direct influence from those languages. *Gurindam* was a type of poem consisting of two lines, where the end rhymes of each pair are identical and there was no set limit on the number of lines. In each pair of lines, there was a connection or correspondence between the first line and the second line. If *pantun* has a hint, *syair* was different from it by having no clues. In *syair* the four-line in one stanza was the meaning of everything. *Syair* serves as a narrative composed in stanza form, with each stanza conveying a specific emotion. The final rhyme pattern in *syair* was aaaa, and each line typically consisted of four to five words (Saludin, 2013).

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Learning Malay Literature

Learning Malay literature was important because it helps us understand and appreciate our cultural heritage. Other than that, it allows us to connect more deeply with language, history, and the creative works from the previous generation. Each poetry such as *gurindam, pantun,* and *sajak* basically tells a story also and gives a lesson, so how wonderful it would be if be able to understand what they are trying to convey.

Syair

Malay poetry, known as syair was one of the various traditional forms of Malay poetry. Syair can be categorized into two types: narrative and non-narrative. Narrative syair involves storytelling, such as romantic syair, metaphorical syair, and historical syair. In contrast, non-narrative syair includes non-storytelling forms such as religious and advisory syair. Syair has several distinct features. Firstly, it consists of four lines in a stanza. Each line contains four words and consists of 8-12 syllables. The end rhyme pattern for a *syair* is a-a-a-a. Unlike a standalone *pantun*, a single stanza of *syair* cannot stand alone. What was conveyed through *syair* was a clear unity, unlike a *pantun* that contains imagery and meaning. Based on these characteristics, *syair* was described as having a high aesthetic quality. It also reflects the wisdom of the past society in creating it as a form of entertainment medium during that time.

Gurindam Dua Belas

Gurindam Dua Belas by Raja Ali Haji functions as a means of communication with the audience through its morally rich content. This illustrates how the author utilizes gurindam as an effective medium to convey messages to the readers. Gurindam can fulfill the function of a work that was to guide the reading community based on the formation of morals through the questions and thoughts contained within it. According to (Idris, 2015). The function of

gurindam as a means of communication was also evident in how it serves as a form of moral communication, as influenced by the selection of words like diction, symbolism, and other elements present within gurindam.

Seloka

The "*seloka*" originates from the word "shloka" in Sanskrit, which means a poem consisting of two lines. *Seloka* mostly contains elements of humor, satire, and criticism towards the behavior of an individual or a group within Malay society (Ab et al., 2019).Structurally, *seloka* is a type of traditional Malay poem that doesn't have a distinct form like *pantun* and *syair*. The purpose of a "*seloka*" is to convey criticism and satire towards a particular flaw or discrepancy within a society (Ab et al., 2019). These critiques and satirical remarks are sharp and delivered in a playful and witty manner. Through *seloka*, one can also understand the Malay culture of not criticizing directly, but rather employing a subtle approach. The words used in *seloka* serve as symbols with implied meanings (Ab et al., 2019). Therefore, in this form of poetry, the author utilizes comparisons such as analogies, metaphors, similes, and personification, so that each metaphorical expression can connect with the souls of the community.

Mobile Application

Mobile applications are often referred to as mobile app where the term app was a shortened form of application which specifically refers to software designed to run on mobile devices such as smartphones and tablets to perform a certain task for a user (Waslam & Mazumder, 2010). Mobile apps known as mobile applications are characterized by their ease of use, user-friendly interfaces, and ability to run on a wide range of mobile phones. Mobile applications have extensive functionality and serve a broad range of purposes such as browsing the internet, playing audio and video content, and enjoying games (Waslam & Mazumder, 2010). Mobile applications have emerged because of the combination and integration of various elements such as media, information technology, the internet, and advanced technologies (Phongtraychack & Dolgaya, 2018).

Mobile applications play an important role in connecting users to internet services. With the constant use of mobile devices, particularly among the younger generation, people rely heavily on their smartphones and tablets to browse the World Wide Web and if your

presence was not established in the realm of mobile applications, it was like missing the opportunities. A lot of advantages of using mobile applications such as applications help minimize expenses by reducing the need for SMS messages and paper newsletters. Applications like WhatsApp and Messenger help deliver direct messages to another user, simplifying the process and eliminating expenses (Phongtraychack & Dolgaya, 2018).

Benefit of mobile application

Mobile applications offer users a wide range of benefits, not only for individuals and businesses but the entire community as well. This application facilitates and improves various aspects of daily life such as in terms of enhanced communication, save users time, less power consumption, cost saving, and making daily tasks and activities more efficient and enjoyable. One of the benefits that can be seen was in terms of fast and smooth communication, mobile applications such as Facebook, WhatsApp, Messenger, and Skype play a role in connecting individuals within society. Regardless of the distance, these applications enable people to stay in touch everywhere and anywhere. This connectivity proves beneficial for families, friends, and society as a whole (Waslam & Mazumder, 2010).

M-Learning

The rapid development of information technology in our time has increased the interest in technology and people's needs. Although this technology device and use was subject to a certain environment or location in the past, environment, and location now have their independent expertise in recent times. Based on research by (Keegan, 2001) Mobile learning, defined as the delivery of education through PDAs, pocket PCs, and mobile phones, gains its unique advantage over e-learning through the widespread availability and utilization of mobile devices. Mobile learning was a form of education where the learner was determined previously, not bound to a specific location, and takes advantage of the opportunities provided by mobile technologies (Korucu, A. T., & Alkan, A., 2011). Mobile learning brings about shifts in the learning environment, allowing learning to occur regardless of time or location. mobile learning represents the future of education, with the learning environment being shaped by wireless technologies.

Constructivism Learning Theory

According to constructivism, learning was influenced by the environment in which an idea was taught and by students' beliefs and attitudes (Olusegun, 2015). In other words, the context of learning and students' own thoughts and perspectives play a significant role in shaping their understanding and development of knowledge. Constructivism was a theory that explains how people learn by observing and studying. It suggests that individuals construct their own understanding and knowledge of the world by actively engaging in experiences and reflecting upon them (Olusegun, 2015). In this project videos to present *KOMSAS* literature in visual. It allows students to actively interact with the video through pause and reflect moments. While audio was to utilize audio recording to enhance the learning experience such as narration of *KOMSAS* literature. Students can actively listen to the audio content, take notes, and engage in further discussions or reflections. Other than that text was use for student to read and analyze by include the active reading strategies such as highlighting the key points. In quiz, the quiz would be designed to recall including the question that require thinking such as the themes or character in the *KOMSAS*. There are some characteristics of applied constructivism theory in this project such as:

1. **Absorb information better.**

   Learners absorb information more effectively as they build their understanding through new methods and experiences. Active engagement with video, sound, and quizzes in the mobile application facilitates this process.

2. **Deeper understanding.**

   It promotes a deeper understanding and retention as it emphasizes the learner's interaction with objects and events rather than relying solely on the teacher or instructor, the conventional method of teaching vocabulary typically involves the teacher (Gao, 2021).

3. **More enjoyable.**

   Students experience enhanced enjoyment, as the mobile application allows them to learn anytime, anywhere. The dynamic learning environment provided by the application differs from traditional textbook-based learning.

PCMJ
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Website: fskmjebat.uitm.edu.my/pcmj

4. **More confident.**

   Learners gain confidence before entering the classroom, having already attempted to understand and learn through methods like watching videos and listening to audio.

METHODOLOGY

A systematic approach was crucial in the development of a mobile application to enhance its overall effectiveness in the development process. The ADDIE development model stands out. as a more fitting and systematic approach. The choice of methodology for this mobile application project is ADDIE model, as it represents a more suitable and systematic approach to development. The goal of interactive instructional materials is to help students understand abstract ideas. So, when designing interactive multimedia, it should make learning more interesting. This can include using technology and animated media, making it easier for students to learn and gain knowledge (Mohd Jais et al., 2022) ADDIE model consists of five phases which are Analysis, Design, Development, Implementation, and Evaluation. Every stage of this model was interconnected and acts as an adaptable guide for creating an efficient training approach. Once the steps within a phase are concluded, the next stage progresses. Furthermore, the project has decided to adopt the ADDIE methodology due to its efficiency. The ADDIE model was utilized in developing the mobile app because of its thorough editing phases and the chance to make repeated corrections during the training material design process.

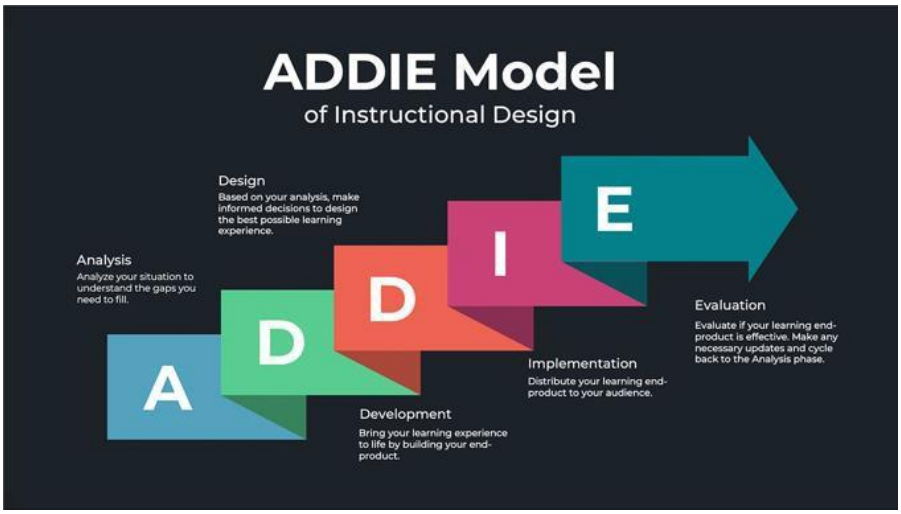

Figure 1: ADDIE Methodology

PCMJ
Progress in Computer and Mathematics Journal (PCMJ)
volume 1 [October, 2024]
e-ISSN: 3030-6728
Website: fskmjebat.uitm.edu.my/pcmj

Analysis Phase

During the analysis stage in ADDIE, the main objective is to identify and understand the problem while devising an effective solution.

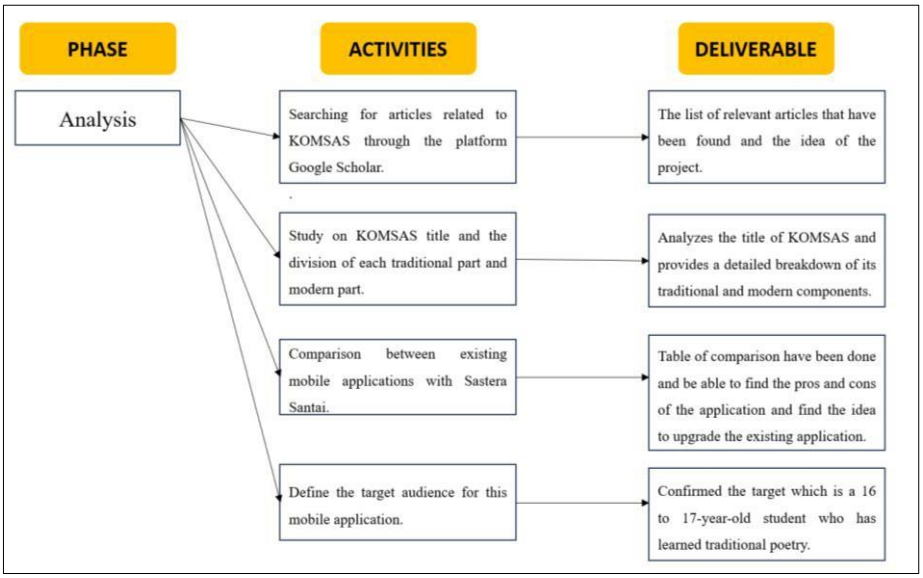

Figure 2: Analysis Phase

Design Phase

During this phase, the design process involves creating a design that is implemented by drawing a storyboard and flowchart to ensure it meets the desired taste or requirements.

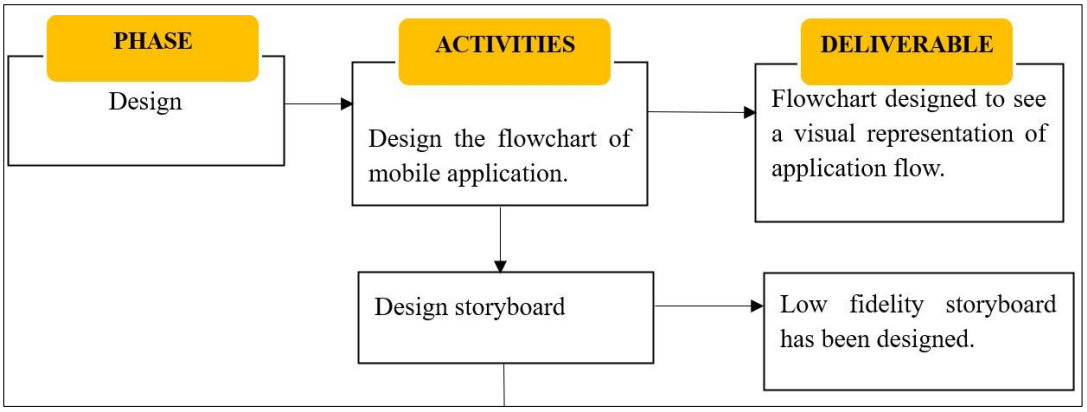

Figure 3: Design Phase

PCMJ
Progress in Computer and Mathematics Journal (PCMJ)
volume 1 [October, 2024]
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Flowchart

At the beginning of mobile app development after confirmation, the flowchart illustrate above was generated. The flowchart has undergone several revisions to achieve the optimal flow. This flowchart has been employed to create the best and most user-friendly mobile development.

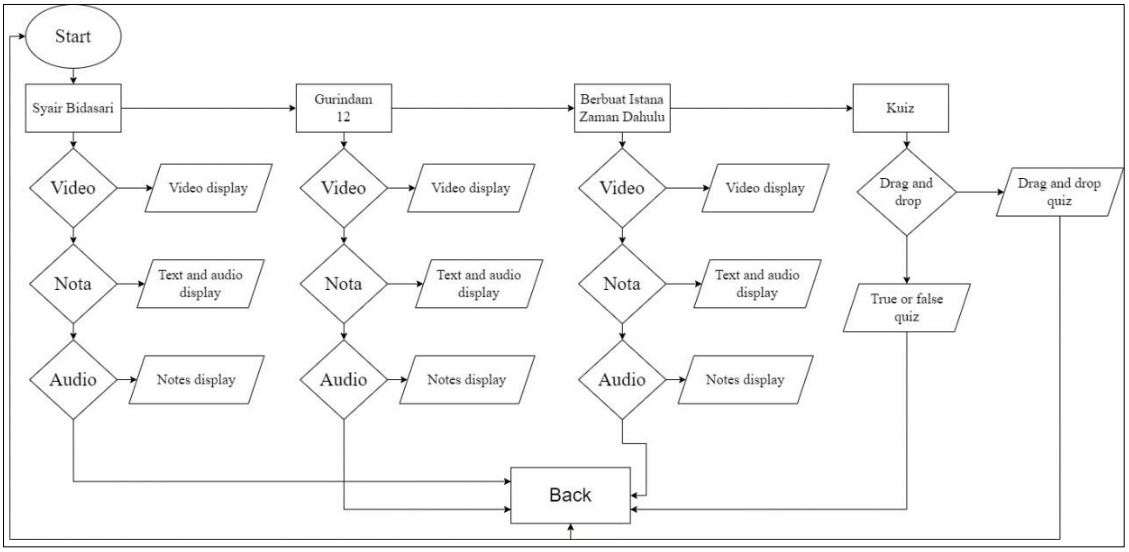

Figure 4: Flowchart

Development Phase

The next phase is the development phase where in ADDIE methodology the development phase was where the project's implementation occurs. During this phase, the development was focused on writing coding, designing, and building software components to ensure their proper functionality.

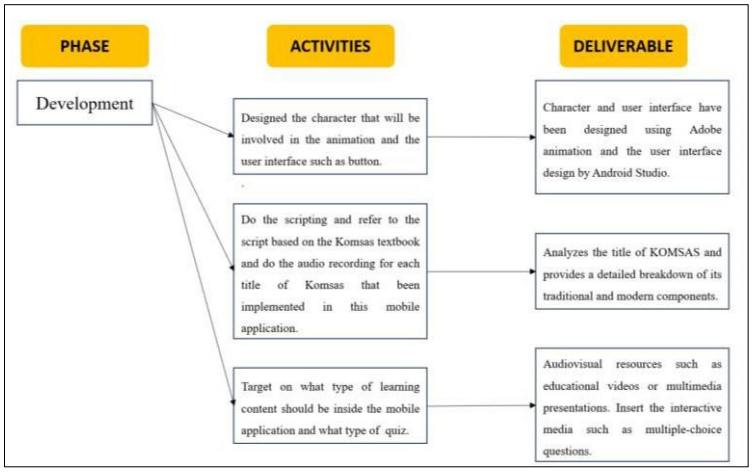

Figure 5: Development phase

PCMJ
Progress in Computer and Mathematics Journal (PCMJ)
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Table 1: Hardware Requirements

No	Features	Requirement
1	Device	Handphone or Tablet
2	Processor	Snapdragon 800
3	RAM	4 GB
4	Storage	5 GB
5	Battery	3000mAh

Implementation Phase

The implementation phase in ADDIE was when the plan from the previous stages was put into action. This was where all the materials and resources were assembled, and the actual training or educational program was delivered to the target audience. It involves executing the lessons, activities, and assessments designed during the development phase. This phase requires close attention to detail and effective coordination to ensure that everything runs smoothly. Additionally, any necessary adjustments are made in real time based on the feedback and outcomes observed during implementation. This phase was crucial in bringing the project to life and testing its practicality in a real-world setting.

Evaluation Phase

The evaluation phase was the part to evaluate if the project that has been done was effective and meeting its goals. Sastera Santai main goal make the student be able to know how the rhythm should be read on either *gurindam* or syair. During this phase, we carefully look at different parts, like how well the teaching methods work, how interested the students are, and what difference it makes in what they learn.

Table 2: System Usability Scale (SUS)

I think that I would like to use this system frequently.
I found the system unnecessarily complex.
I thought the system was easy to use.
I think that I would need the support of a technical person to be able to use this system.
I found the various functions in this system were well integrated.
I thought there was too much inconsistency in this system.
I would imagine that most people would learn to use this system very quickly.
I found the system very cumbersome to use.
I felt very confident using the system.
I needed to learn a lot of things before I could get going with this system.

PCMJ

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RESULT AND DISCUSSION

The project was conducted with students aged 16 to 18 years old, focusing on those studying the Malay language.

Table 3: Result Calculation System Usability Scale

Respondent	**Odd question**	**Even Question**	**Raw Calculation (SUS)**	**Final Score (SUS)%**
1	15	11	26	65
2	20	19	39	97.5
3	20	20	40	100
4	16	16	32	80
5	10	10	20	50
6	20	19	39	97.5
7	17	18	35	87.5
8	18	19	37	92.5
9	17	6	23	57.5
10	20	20	40	100
11	18	14	32	80
12	20	20	40	100
13	18	12	30	75
14	15	20	35	87.5
15	20	20	40	100
16	15	20	35	87.5
17	17	19	36	90
18	16	19	35	87.5
19	18	20	38	95
20	20	20	40	100
21	15	15	30	75
22	15	20	35	87.5
23	11	20	31	77.5
24	14	11	25	62.5
25	10	20	30	75
26	14	20	34	85
27	14	16	30	75
28	13	19	32	80
29	12	20	32	80
30	15	15	30	75
31	15	15	30	75
32	20	20	40	100
Average SUS Score			83.67%	

Since the testing began at the beginning of the year, there is an age overlap of 18-year-olds, who are also current SPM candidates. The project has been using a system usability scale (SUS) to evaluate the usability of mobile applications. The table below outlines the SUS evaluation calculation, where for each of the 10 questions, the scores are divided into odd and even groups. If the question number is odd, the scores are summed up to calculate the overall SUS odd score, and then 5 is subtracted from the total. Subsequently, the scores for the 5 even-numbered questions are summed, and 25 is subtracted from this total. The final SUS Score is calculated by adding the results from both odd and even calculations and multiplying the sum by 2.5. An average SUS score of 83.67% suggests that most people find the system quite user-friendly and effective. Higher scores on the SUS scale, which goes up to 100, generally indicate greater satisfaction. Describing this project as excellent is fitting due to the high average score.

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