



## MEK MULUNG MEETS THE DIGITAL AGE: AN EVALUATION OF E-MEKLUNG

Jasni Ahmad<sup>1\*</sup>, Mohamad Hanif Abu Hassan<sup>2</sup>, Fakhru Anuar Aziz<sup>1</sup>, Ng Yi Cong<sup>1</sup>, Sammi Goh Chin Ying<sup>1</sup>

<sup>1</sup>School of Multimedia Technology and Communication, Universiti Utara Malaysia, 06010 UUM Sintok, Malaysia

<sup>2</sup>School of Business Management, Universiti Utara Malaysia, 06010 Sintok, Malaysia

\*Corresponding Author Email: [jasni13ahmad@gmail.com](mailto:jasni13ahmad@gmail.com)

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### *Abstract*

*Mek Mulung is a vibrant dance-drama from Wang Tepus Kedah, Malaysia, blending dance, acting, music, and singing to bring local myths and legends to life, often featuring tales of love, bravery, and fantasy. With traditional Mek Mulung performances facing the threat of extinction due to a lack of protection and the rise of modern entertainment, it is imperative to preserve this unique art form. To address this gap, this study is developing e-Meklung, a digital adaptation created to engage children and spark their interest in Malaysia's rich cultural heritage. E-Meklung tackles this challenge using Rapid Application Design (RAD) and throwaway prototyping, turning Mek Mulung into an engaging and educational digital experience. Usability testing with 30 children aged 7 to 12 revealed average scores (Means) of 4.47 for ease of use, 4.27 for performance, and 4.32 for satisfaction demonstrating its effectiveness in enhancing their understanding of Mek Mulung. These scores show that e-Meklung not only entertains but also helps children better understand and appreciate the rich culture of Mek Mulung. Ongoing advancements in digital storytelling have the potential to amplify its impact, supporting the preservation of Mek Mulung while promoting cultural heritage education. E-Meklung breathes new life into the Mek Mulung dance-drama by blending tradition with technology, transforming it into an engaging educational tool that enriches cultural learning, fosters diversity in schools, and cultivates a deeper appreciation of Malaysia's cultural heritage among the youth.*

**Keywords:** *Mek Mulung; Dance Drama; Children's Engagement; Digital Storytelling; E-Meklung*

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## INTRODUCTION

Digital storytelling has revolutionised educational methodologies, providing innovative ways to impart cultural heritage to younger generations (Robin, 2008). This is particularly crucial in the context of rapidly evolving digital environments where traditional practices risk being overshadowed by modern entertainment forms. The "e-Meklung" represents a significant effort to address this challenge by introducing children to the traditional Malay performance art of Mek Mulung through an interactive digital storybook. This prototype integrates modern educational strategies, such as multimedia and interactive elements, to create a compelling and effective learning tool for young audiences.

Mek Mulung is a lively dance-drama originating from Wang Tepus, Kedah, Malaysia, combining dance, acting, music, and singing to depict local myths and legends, often centered around themes of love, courage, and fantasy (Kementerian Kebudayaan, Kesenian dan Pelancongan Malaysia, 2003) (Figure 2). In December 2023, Mek Mulung, a traditional theatre heritage from ancient Kedah, was officially added to the List of Intangible Cultural Heritage in Need of Urgent Safeguarding during the 18th Session of the Intergovernmental Committee for the Safeguarding of Intangible Cultural Heritage (IGC ICH). This prestigious listing was decided by the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage of UNESCO (Figure 1).



Figure 1: Mek Mulung has received recognition from UNESCO

Source: Abdullah (2023)

However, the preservation of Mek Mulung faces considerable challenges in the contemporary digital era. The dominance of modern entertainment and the decreasing attention to traditional practices have led to the risk of Mek Mulung fading into obscurity. Digital storytelling offers a solution by transforming Mek Mulung into a more appealing and accessible format for today's children. The term "e-Meklung" emphasizes the electronic and interactive aspects of the project, aiming to bridge the gap between traditional cultural practices and the digital engagement preferred by contemporary audiences (Kamil et al., 2024; Mohd Yusoff & Zahari, 2020). Educational theories support the use of multimedia learning, suggesting that presenting information through various sensory channels can enhance understanding and memory retention. The e-Meklung digital storybook incorporates audio, visual, and interactive elements to create an immersive educational experience. By engaging multiple senses, the storybook aims to capture children's interest and facilitate a deeper understanding of Mek Mulung. The primary goal of this study is to evaluate the effectiveness of e-Meklung in teaching cultural education and engaging its target audience. The study employs formative evaluation methods to gather feedback on the storybook's usability,

multimedia features, and educational impact. This feedback will be used to guide further improvements, ensuring that the final product is both user-friendly and educationally valuable. The paper is organised to include a comprehensive literature review, detailing relevant research and guidelines for developing digital storytelling and educational multimedia. The methodology section describes the evaluation methods used in the study, including surveys, interviews, and usability testing. The analysis and results section present the findings, demonstrating how well the digital storybook achieves its educational objectives. Finally, the conclusion summarises the study's implications for future research and practical applications.



Figure 2: The Mek Mulung actors are performing live on stage  
Source: Suara Merdeka (2023)

### Digital Solutions for Cultural Preservation

In Malaysia, the traditional performing art of Mek Mulung is at risk of fading away, making it crucial to find innovative solutions. Digital technology offers an opportunity to create multimedia courseware that not only preserves Mek Mulung's performances, storylines, and details but also makes them accessible to a broader audience (Rahman, 2016). Mek Mulung, a captivating traditional art deeply rooted in Kedah's cultural heritage, is facing imminent threats to its preservation and transmission to younger generations. Despite its origins dating back to the 16th century (Nur Izzati, 2019), Mek Mulung is on the verge of obscurity due to the dominance of digital media and the decreasing role of traditional storytelling in modern society (Shaari & Rosli, 2024). The unique combination of storytelling, music, and shadow puppetry that defines Mek Mulung risks disappearing, potentially erasing a rich cultural legacy. The scarcity of Mek Mulung performances compared to more well-known traditional Malay arts further compounds this issue, leading to limited recognition and understanding of its distinct character (Mastika, 2021). While digital platforms present valuable opportunities for cultural preservation, existing resources frequently lack the authenticity and cultural richness of Mek Mulung, limiting their ability to effectively engage younger audiences (Shaari & Rosli, 2024). To address these urgent issues and ensure Mek Mulung's ongoing relevance, a creative solution is needed to connect traditional art forms with the evolving interests of younger generations (Hassan, 2021; Ibrahim, 2022). This study seeks to tackle these challenges by developing an interactive and culturally authentic digital storybook for children aged 7 to 12, fostering cultural literacy and appreciation to preserve Mek Mulung's heritage.

Preserving the Mek Mulung culture for younger generations is challenging due to the shortage of engaging and culturally relevant educational materials tailored to children aged 7 to 12 (Shaari & Rosli, 2024). Traditional storytelling methods are not effectively reaching this age group, leading to a disconnection from their cultural

heritage. Existing digital storytelling platforms often fail to capture the essence of Mek Mulung's storytelling traditions and the cultural nuances of its narratives. This lack of authenticity reduces the effectiveness of digital storytelling in promoting Mek Mulung among children (Baker, 2020). To overcome these challenges and ensure Mek Mulung's cultural vitality, it is essential to develop a culturally authentic and interactive digital storybook tailored to children aged 7-12 (Hassan, 2021; Ibrahim, 2022). The storybook should include engaging narratives, culturally relevant visuals, and interactive elements that align with this age group's learning preferences (Hassan, 2021). By enhancing cultural literacy and appreciation among children, this digital storybook will play a crucial role in preserving and transmitting Mek Mulung culture to future generations.

### **Preserving Mek Mulung in the Digital Age**

Cultural heritage preservation is a multifaceted challenge that requires innovative approaches to remain relevant in the digital age. One effective method involves leveraging the creative industry to safeguard cultural practices (Hani et al., 2012). Mek Mulung, a traditional Malay performance art, faces the risk of becoming obsolete due to competition with modern entertainment and the difficulties inherent in preserving traditional arts in a rapidly changing world. The study seeks to address the challenge of preserving Mek Mulung, a traditional Malay dance-drama, by focusing on making it more engaging and accessible to children aged 7 to 12. This particular age group is vital because these children are at a critical stage of cognitive and social development, where they are highly influenced by the media they consume. Today, children in this age range are increasingly immersed in interactive digital experiences, such as mobile apps, games, and online storytelling platforms. Traditional forms of entertainment, like cultural performances, often struggle to compete with these engaging digital formats, leading to a decline in interest among younger generations.

To address this issue, the study proposes transforming Mek Mulung into an interactive digital storybook. This transformation represents a significant shift from the traditional, live performance format to a more dynamic, technology-driven platform. A digital storybook allows Mek Mulung to be reimaged in a way that is visually and interactively appealing to children. This format is designed to capture the attention of young audiences who are accustomed to digital content, providing them with an engaging and enjoyable experience that not only entertains but also educates. The educational aspect of this transformation is central to the study's goals. By presenting Mek Mulung in a storybook format, the content can be structured in a way that promotes learning. For example, the storybook can incorporate interactive elements such as clickable characters, animations, and sound effects, which help children better understand the cultural significance of Mek Mulung. These features can also provide context for the dance-drama's history, symbolism, and key themes, making it an immersive educational tool. The storybook could also include quizzes, puzzles, or choices within the narrative, encouraging critical thinking and deeper engagement with the material. This ensures that children are not only passive observers but active participants in the learning process. In addition to preserving Mek Mulung, this approach is designed to enhance its relevance in today's digital world. By adapting the art form to a digital medium, it becomes more relatable and engaging for children growing up in a technology-driven society. This ensures that Mek Mulung remains culturally relevant to the next generation, as they are more likely to engage with cultural heritage through platforms, they are familiar with, such as tablets, smartphones, and computers. The digital storybook format allows Mek Mulung to evolve alongside modern entertainment, blending tradition with technology to create a unique cultural experience. Digital storytelling is key to transforming how children engage with Mek Mulung by combining visuals, audio, and narrative into an interactive experience. Unlike traditional storytelling, it allows for audience participation, making learning more personal and engaging. By integrating voiceovers, music, and animations, the storybook brings Mek

Mulung to life in a digital format, simultaneously entertaining and educating children about their cultural heritage. This interactive tool enables children to explore the art form at their own pace, making learning fun and memorable, increasing their interest in preserving the cultural practice. Finally, the study emphasizes that by making Mek Mulung more accessible and engaging through digital means, it helps ensure that this important cultural practice is not lost to future generations. The traditional art form can be passed down in a format that resonates with contemporary children, who may otherwise lose touch with their cultural roots due to the overwhelming presence of modern entertainment. By integrating Mek Mulung into digital storytelling, the study aims to safeguard the art form's future, ensuring that it remains an integral part of Malaysia's cultural heritage, even in a rapidly changing world.

### Prototyping Digital Mek Mulung: A Viable Solution

The e-Meklung responds to this challenge by converting Mek Mulung into a digital format. The goal is to bridge the generational gap between older individuals who are familiar with the cultural performance and younger individuals who may not have been exposed to it.



Figure 3: e-Meklung's user interface

Source: Ahmad et al. (2024)

By doing so, the study aims to make cultural heritage more relevant in a modern context, ensuring that younger audiences can engage with and appreciate their cultural roots through a platform they are comfortable with. The transition to digital helps overcome barriers related to the time, space, and effort required to experience traditional performances in their original settings. Figure 3 displays several screens captures from the e-Meklung interface, highlighting key visualization principles such as proximity, alignment and balance, consistency, and contrast. To make the prototype more user-friendly and meet user needs, it was developed based on interaction design theory, focusing on form, content, and behavior.

## LITERATURE REVIEW

Digital storytelling has emerged as a powerful educational tool, offering unique opportunities for conveying cultural heritage to young audiences. Research indicates that user-friendly design and engaging content are crucial for the effectiveness of educational apps (Kuo et al., 2019). Balancing interactive features with educational content is essential to avoid potential distractions while ensuring that the learning objectives are met (Lujun et al., 2021). The preservation of traditional arts, such as Mek Mulung, is a pressing challenge in the modern digital age. With changing societal dynamics and the increasing dominance of digital entertainment, traditional art forms risk being forgotten or overlooked by younger generations. Shaari and Rosli (2024) addresses this issue by stressing the importance of adapting traditional art forms to digital media. This adaptation is essential for making cultural heritage more accessible, relatable, and appealing to young people, who are more familiar with digital formats such as apps, games, and multimedia storytelling. The goal is to ensure that traditional arts like Mek Mulung are not limited to older generations but evolve in a way that resonates with today's youth, promoting continuity across generations.

In this context, Shaari and Rosli (2024) emphasises that digital storytelling has the potential to strengthen the emotional connection between audiences and content. By blending personal stories with multimedia features such as audio, visuals, and interactive elements, digital storytelling enables audiences to engage more deeply with cultural material. This form of emotional involvement is especially impactful in cultural education, where the content conveys not only entertainment but also historical context and emotional depth. For example, Mek Mulung, with its intricate dance, costumes, and stories, can evoke a deeper appreciation of cultural history when presented in an emotionally resonant, multimedia-enhanced digital storybook. The audience is not just watching; they are emotionally immersed in the experience, which can lead to a stronger understanding and retention of the cultural content. Mayer's (2009) cognitive theory of multimedia learning provides an additional layer of support for the use of multimedia elements in educational tools. This theory suggests that when learners are presented with content through multiple sensory channels, such as sight, sound, and interaction, learning is more effective.

Multimedia enhances both comprehension and retention, meaning that young audiences are more likely to understand and remember the cultural elements of Mek Mulung when they are presented through engaging visuals, audio, and interactive storytelling. For example, instead of just reading about Mek Mulung, children could interact with characters, listen to traditional music, and see animated performances, making the experience more vivid and memorable. Reeves (1998) highlights the importance of interactivity in educational technology. Interactive tools such as quizzes, puzzles, or choose-your-own-adventure stories can enhance the learning experience by actively involving the audience. In the case of the e-Meklung, interactive features could include options for children to choose the outcome of a story, answer questions about the performance, or explore different aspects of the cultural

performance through clickable elements. This active engagement transforms the learning process from a passive activity into a more dynamic experience, increasing the likelihood that children will stay engaged and absorb the cultural lessons presented.

Lastly, Eval Community (2024) stresses the importance of ongoing refinement of digital storytelling tools through user feedback. As children and other users interact with the e-Meklung digital storybook, their feedback can inform updates and improvements, ensuring that the content remains engaging, relevant, and educational. Continuous improvement is key to keeping the educational tool fresh and effective over time, responding to the evolving needs and preferences of the audience. For example, based on feedback, additional interactive elements could be added, or the narrative could be adjusted to better capture the attention of young audiences. In summary, the literature reviewed highlights the need for innovative digital storytelling approaches that combine educational rigor with engaging multimedia experiences. These techniques serve as the foundation for the e-Meklung, which aims to preserve and promote Mek Mulung by transforming it into an interactive digital format. This not only helps to protect this traditional art form but also makes it more accessible, engaging, and relevant for younger audiences, ensuring that future generations can connect with and appreciate their cultural heritage.

## METHODOLOGY

This study employs a mixed-methods approach to evaluate the digital storybook's effectiveness in teaching cultural education and engaging its target audience. It integrates user feedback, expert reviews, and a structured design process. Initially, feedback is collected to refine the storybook's multimedia elements and interactive features, ensuring they meet the needs of children aged 7 to 12. Prototypes of the storybook are then tested with this age group to assess both usability and educational impact. The collected feedback is analysed to enhance the storybook's user-friendliness and accurately reflect Mek Mulung's cultural heritage. Figure 4 illustrates the seven (7) phases of the e-Meklung development process: starting with requirements and planning, followed by analysis, design, implementation, evaluation, and finally deployment.

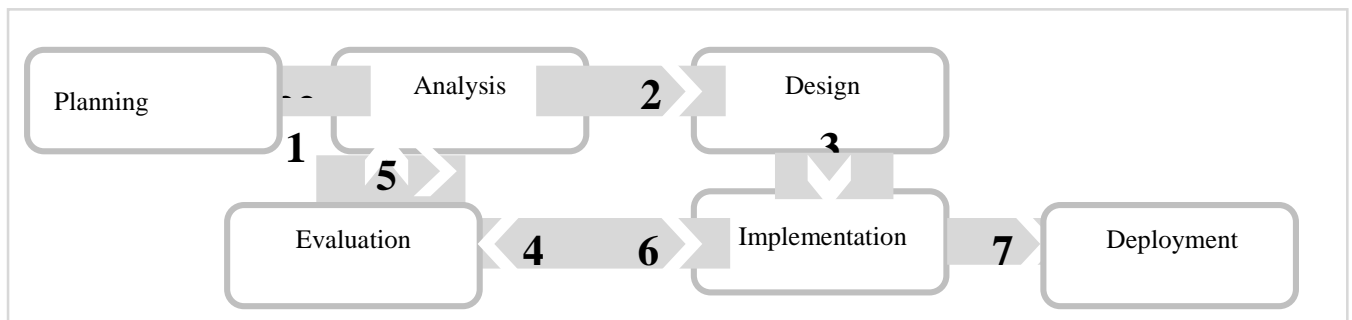







Figure 4: e-Meklung development phases

A critical component of the methodology is usability testing, which involves observing children as they interact with the storybook. This direct observation helps identify usability issues and collect qualitative and quantitative data on the storybook's performance and user experience (Bastien, 2010; Lewis, 2012; Krug, 2014; Annamalai, 2022). According to Nielsen (1993), usability testing involves observing users as they interact with a product to identify any issues and improve the overall user experience. In the e-Meklung, usability tests were conducted with

30 children. Usability tests were conducted with 30 children, who participated in face-to-face sessions scheduled at different times and dates. Each child was provided with a laptop to use the e-Meklung application, and researchers were present to offer assistance and ensure the sessions ran smoothly. During the use of e-Meklung, researchers guided the children to facilitate ease of use and support the overall flow of the session. Simultaneously, surveys were distributed for the children to complete. Data collection was carried out with two to three children at a time. Parents were also present to assist their children, contributing to a more effective and efficient process.

A usability evaluation was conducted using a verbally administered questionnaire, adapted specifically for young children unfamiliar with standard survey methods. To assess e-Meklung's performance, a 15-item USE (Usefulness, Satisfaction, Ease of Use) questionnaire was modified, with questions simplified and delivered verbally. Children rated responses on a Likert scale from 1 to 5, represented by infographic visuals (emoticon-based) (see Table 1). Feedback from interviews and these adapted questionnaire responses provided insights into the prototype's strengths and areas for improvement. A total of 30 responses were recorded and analyzed in SPSS to evaluate usability and effectiveness.

Table 1: Emoticon-based Likert scale

	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
<b>Scale</b>	1	3	3	4	5
					
<b>Category</b>	Disagree		Neutral	Agree	

This study utilised a hybrid data collection method, integrating physical explanations with online surveys. The survey, designed using Google Forms, a free tool for creating and sharing surveys, focused on individual participants as the unit of analysis. Respondents typically spent about 15 minutes completing both the testing and the survey. The questionnaire was structured into several sections: Section 1 collected demographic information, and Section 2 assessed various aspects, which were categorised into three main features: Ease of Use (6 items), Performance (5 items), and Satisfaction (4 items).

**RESULTS AND DISCUSSION**

The results of the usability testing are presented in Tables 2, 3, and 4, which summarise the mean evaluation scores for ease of use, performance, and satisfaction. The feedback gathered from the usability testing provides valuable insights into the strengths and areas for improvement in e-Meklung. The positive scores indicate that the digital storybook effectively teaches Mek Mulung and engages young audiences. Nonetheless, there are opportunities for improvement to further enhance the educational experience and address any existing issues.

### Measures of Central Tendency for Ease of Use, Performance and Satisfaction

Table 2 shows a positive acceptance regarding ease of use, with mean scores for all six items in this category exceeding 4.00. The overall ease of use received a favorable mean score of 4.47 out of 5. The highest mean score, 4.88, was for item 6, indicating that the e-Meklung interface, including icons and buttons, was consistent and easy to understand, which significantly aided students in grasping the subject matter and simplifying the completion of test module tasks. Generally, respondents found the storybook easy to navigate and comprehend, although there were some discrepancies in feedback concerning the usability of the storybook without a demonstration video.

Table 3 presents the results for the performance dimension, revealing a positive reception with mean scores exceeding 4.00 for all five items. The performance aspects of the storybook achieved an average score of 4.27, indicating that the audio, video, and animation features were largely well-received. Respondents noted the consistency and relevance of these components, though some feedback highlighted opportunities for enhancing the quality and integration of the multimedia elements. Overall, it can be concluded that e-Meklung excels in being engaging, attractive, professional, and impressive.

The overall means for satisfaction derived from the data collected is 4.32 (see Table 4). Such result implies that the students perceived e-Meklung as useful and fulfil their satisfaction in learning the topic of story of Mek Mulung and also the mind test module. Besides being useful and satisfying, the elements of Mek Mulung in e-Meklung have also been well accepted by the students, and this is a positive indication that e-Meklung has a great potential to be used as one way of preserving Mek Mulung, one of the Malaysia's cultural heritage. Most respondents indicated that they would recommend the storybook for school use and expressed increased interest in Mek Mulung after using it. This positive feedback highlights the storybook's effectiveness in engaging children and promoting an appreciation for cultural heritage.

Table 2: Data analysis of ease of use

	<b>Variables</b>	<b>Mean</b>
Item 1	The e-Meklung is easy to understand and use.	4.44
Item 2	All of the features are easy to navigate.	4.44
Item 3	The e-Meklung is user-friendly.	4.34
Item 4	I can use the e-Meklung without watching the demo video.	4.44
Item 5	I can find the function I need in the e-Meklung.	4.28
Item 6	All of the icons and buttons are consistent and easy to understand.	4.88
<b>Overall Average</b>		<b>4.47</b>

Table 3: Data analysis of performance

	<b>Variables</b>	<b>Mean</b>
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Item 1	The audio elements in e-Meklung are consistent and relevant.	4.32
Item 2	The voice-over of the narrator is clearly audible.	4.50
Item 3	The video elements in courseware are interesting and relatable to content.	4.16
Item 4	The animation production is professional and attractive.	4.22
Item 5	The interface design looks attractive.	4.14
<b>Overall Average</b>		<b>4.27</b>

Table 4: Data analysis of satisfaction

<b>Variables</b>		<b>Mean</b>
Item 1	I can efficiently learn about e-Meklung through e-Meklung.	4.34
Item 2	The content about e-Meklung is adequate and interesting.	4.20
Item 3	The content is easy to understand and impressive.	4.38
Item 4	I am satisfied when using e-Meklung.	4.34
<b>Overall Average</b>		<b>4.32</b>

### Study’s Significance and Impact

The e-Meklung addresses several key challenges identified in recent research. Researchers have highlighted the need for educational tools that effectively balance engaging content with educational value, particularly in the context of cultural heritage (Kuo et al., 2019; Lujun et al., 2021). By converting Mek Mulung into an interactive digital storybook, it enhances its accessibility and relevance to contemporary audiences (Ahmad, 2015; Lambert, 2013). This approach aligns with current trends in educational technology, which emphasize the importance of creating immersive and interactive learning experiences through multimedia platforms (EvalCommunity, 2024; Johnson et al., 2018). The integration of audio, visual, and interactive elements aims to enrich cultural education and foster a deeper understanding among young learners (Ohler, 2013). Summative evaluation methods are crucial for ensuring that the digital storybook remains relevant and effective. By incorporating user feedback, the application can continuously improve its design and functionality, ensuring that it meets the educational and engagement goals (Scriven, 1967). The e-Meklung’s ability to preserve cultural heritage while engaging young audiences underscores its significance in promoting cultural diversity and supporting educational objectives (Kasemsarn & Nickpour, 2025).

### CONCLUSION

The e-Meklung study marks a significant advancement in the field of digital storytelling for cultural education. By converting the traditional Mek Mulung performance into an interactive digital storybook, the study creates a

compelling and immersive learning experience tailored for children. The storybook's high ratings in performance, ease of use, and user satisfaction highlight its effectiveness in enhancing children's understanding of Mek Mulung and its cultural significance. E-Meklung's iterative refinement process, driven by user feedback, showcases its capacity to bridge the gap between traditional cultural practices and contemporary digital engagement. This iterative approach ensures that the storybook evolves in response to user needs and preferences, thereby maximizing its educational impact. Ongoing updates and improvements will be crucial to sustaining the storybook's relevance and effectiveness in promoting Malaysia's rich cultural heritage.

The e-Meklung project is a groundbreaking effort to preserve and revitalize Mek Mulung cultural heritage through engaging digital storytelling. By crafting an interactive educational tool, it captures the interest of younger audiences while enriching their understanding of cultural diversity through vibrant multimedia elements. This innovative approach not only bridges tradition and technology but also ensures that the captivating stories of Mek Mulung continue to inspire future generations.

Future enhancements for e-Meklung will focus on several key areas. Refining the multimedia elements will aim to create a more immersive and engaging experience for users (Wan Isa et al., 2018). This includes improving the quality of audio, video, and animation to ensure a seamless integration of these elements. Incorporating multilingual support will broaden the accessibility of the storybook, making it available to a wider audience and accommodating the diverse linguistic backgrounds of Malaysia's population. Creating additional modules that explore other aspects of Malaysian cultural heritage will enhance the educational content and offer a more thorough cultural experience. Collaborating with local communities is vital to ensure content authenticity and cultural accuracy. Moreover, partnering with educational platforms and institutions will improve the distribution and sustainability of e-Meklung, ensuring it reaches its intended audience and remains a valuable educational tool. In summary, e-Meklung offers a promising solution for preserving and promoting cultural heritage through digital storytelling. By tackling the challenges of cultural preservation and utilizing digital technology, this study seeks to make traditional practices more accessible and engaging for future generations.

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