

## A Proposal for Developing UX Instruments to Digitize Wayang Kulit Learning in Malaysian Arts and Culture

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**ABSTRACT** - The traditional Malaysian art of Wayang Kulit faces declining engagement, particularly among younger audiences, highlighting the need for innovative approaches to cultural preservation. This study proposes the development of user experience (UX) measurement instruments to evaluate digital Wayang Kulit learning platforms, focusing on engagement, learning outcomes, and cultural authenticity. Grounded in Activity Theory, Social Learning Theory, Cultural-Historical Analysis, User Experience Theory, and Digital Learning Theory, the study presents a conceptual framework linking traditional practitioners, UX designers, and users through digital platforms and measurement instruments. This framework guides the creation of interactive, culturally sensitive digital experiences that preserve the essence of Wayang Kulit while engaging modern learners. The research identifies five key areas: Digital Cultural Preservation, Digital Tools for Engagement, UX Design for Cultural Platforms, Theoretical Frameworks, and Measuring Digital Learning Experiences. The WAYANG EDU application software serves as a central case study, illustrating practical applications and addressing gaps in digital cultural preservation research. Findings aim to inform the design of effective digital platforms and measurement tools that sustain traditional arts, enhance learning outcomes, and provide a model for global cultural preservation initiatives. By combining cultural heritage with digital innovation, this study contributes to the continuity and accessibility of Malaysia's intangible cultural heritage for future generations.

### INTRODUCTION

Wayang Kulit, the traditional shadow puppetry of Southeast Asia, is a cornerstone of Malaysia's cultural heritage. The National Cultural Policy (DAKEN, 2021) emphasizes preserving traditional arts amid modernization. However, its popularity has declined, particularly among younger generations who favor digital entertainment (Tan, 2023).

Preserving and promoting Wayang Kulit in a digital-dominated world is increasingly challenging. Reports from the Jabatan Warisan Negara highlight difficulties in attracting young audiences, while digital content consumption continues to rise (Ministry of Tourism, Arts and Culture Malaysia, 2021).

Yet, Wayang Kulit remains culturally significant, transmitting values, historical narratives, and artistic techniques across generations (Rahman & Hassan, 2024). Traditional preservation methods struggle to engage modern learners, creating a need to integrate traditional arts into digital platforms (Ahmad & Nor, 2019).

Digital transformation offers opportunities for cultural preservation, including wider accessibility and enhanced engagement (Ahmad & Nor, 2023). However, assessing the effectiveness of digital learning experiences requires specialized measurement instruments. Traditional evaluation methods often fail to capture the interactive and immersive qualities of digital cultural education (Smith, 2021).

Several theoretical frameworks, such as Activity Theory (Engeström & Sannino, 2023), Social Learning Theory (Park et al., 2024), and Cultural-Historical Analysis (Liu & Park, 2024), can inform the development of such instruments. Research highlights the need for tools that (1) Evaluate user engagement in digital learning, (2) Assess cultural authenticity in digital formats, (3) Analyze learning outcomes in cultural heritage education, and (4) Integrate theoretical foundations explaining interactions between users, technology, and cultural content (Wong & Abdullah, 2024).

This study addresses these gaps by proposing and validating UX measurement instruments specifically for digital Wayang Kulit learning experiences. By reviewing relevant theoretical frameworks and combining insights from digital learning, cultural preservation, and UX design, this research aims to develop practical, culturally authentic, and theoretically grounded tools for evaluating digital cultural heritage education.

## Research Background

In recent years, the digital transformation of cultural heritage has gained momentum. Technologies such as 3D scanning, virtual reality (VR), and augmented reality (AR) offer new ways to document, preserve, and promote traditional arts (Rahman & Hassan, 2024; Thompson et al., 2024). Digitizing Wayang Kulit provides an opportunity to preserve its techniques and stories while making it accessible to a wider, even global, audience (Wong & Abdullah, 2024).

However, digitizing Wayang Kulit comes with challenges, such as maintaining the authenticity of the art form, creating engaging digital content, and ensuring accessibility across platforms and devices (Ministry of Tourism, Arts and Culture Malaysia, 2021; Liu & Park, 2024). At the same time, it offers opportunities such as reaching audiences who cannot attend live performances (Park et al., 2023), supporting innovative educational methods like gamification and AR (Pandey & Kumar, 2024), and enhancing user engagement and learning outcomes through digital learning approaches.

This study focuses on integrating UX instrumentation in the digitization of Wayang Kulit to bridge traditional cultural practices with modern digital experiences (Wong & Abdullah, 2024). Effective user experience (UX) design ensures digital platforms are intuitive, engaging, and conducive to learning (Liu & Park, 2024). In cultural education, UX design must balance authenticity with interactivity, turning static content into immersive learning experiences that foster appreciation and understanding of traditional arts (Thompson & Wong, 2023; Ibrahim & Lee, 2024).

## Problem Statement

Despite its cultural significance, Wayang Kulit is experiencing a decline in engagement, especially among younger generations (Rahman & Hassan, 2024). Maintaining audience interest is challenging in a world dominated by digital media and modern entertainment.

Current digital platforms for Wayang Kulit often lack interactivity and user-centered design, making them less engaging and ineffective for learning (Wong & Abdullah, 2024; Ahmad & Nor, 2023). While studies show that interactive digital platforms using UX principles can enhance learning and engagement (Wong & Abdullah, 2023), these approaches have limited application in the context of Wayang Kulit. Without improvement, there is a risk of continued decline, leading to the loss of cultural knowledge (Ibrahim & Lee, 2024).

Several theoretical frameworks can help address these challenges:

- a) Activity Theory – explains interactions in digital learning environments (Engeström & Sannino, 2023)
- b) Social Learning Theory – shows how cultural knowledge can be transmitted digitally (Park et al., 2024)
- c) Cultural-Historical Analysis – emphasizes preserving authentic cultural contexts (Liu & Park, 2024)

This research aims to develop and validate UX measurement instruments for digital Wayang Kulit learning experiences. By applying these theoretical perspectives, the study seeks to engage modern audiences while preserving this cultural heritage for future generations.

To achieve this, the research is guided by the following objectives:

- a) To analyze the specific needs and characteristics of digital learning experiences in the context of Wayang Kulit within four months by reviewing relevant academic studies and conducting user surveys.
- b) To evaluate and compare various theoretical frameworks (including Activity Theory, Social Learning Theory, and Cultural-Historical Analysis) within six months to identify the most appropriate foundation for developing the measurement instrument.
- c) To design the measurement instrument based on the selected theoretical framework within two months, including the creation of questionnaires, evaluation metrics, data collection methods, conducting a pilot study, and performing statistical analysis to ensure reliability and validity.
- d) To validate the measurement instrument within three months by performing statistical analysis.
- e) To evaluate the practical applicability and measurement effectiveness of the developed UX instrument in digitizing Wayang Kulit learning experiences within two months through implementation testing.

## LITERATURE REVIEW AND RESEARCH GAPS

### Theoretical Framework

Developing a UX measurement instrument for digital cultural heritage learning requires grounding in multiple theoretical frameworks that address both technological and cultural dimensions (Liu & Park, 2024). Activity Theory helps explain how learners interact with digital tools and cultural content, clarifying the relationships between users, platforms, and learning tasks (Ahmad & Nor, 2023). Social Learning Theory highlights collaborative learning and community engagement, which is useful for designing interactive digital cultural experiences (Wong & Abdullah, 2024). Cultural-Historical Analysis guides the preservation of cultural authenticity while ensuring accessibility in digital environments (Liu & Park, 2024; Rahman & Hassan, 2024). User Experience (UX) Theory provides principles for designing user-centered and culturally sensitive interfaces, which are critical for developing effective measurement instruments (Pandey & Kumar, 2024). Finally, Digital Learning Theory offers insights into online engagement and knowledge transfer, emphasizing the importance of measuring both learning outcomes and cultural preservation (Wong & Abdullah, 2024; Ibrahim & Lee, 2024).

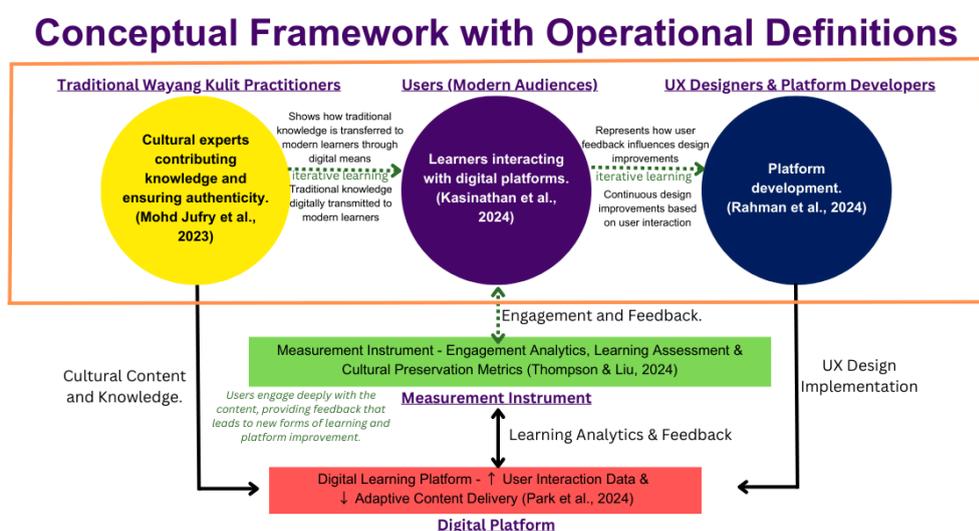
The selection of appropriate theoretical framework(s) will be guided by comprehensive literature review and practical application analysis. Recent research by Zhang and Liu (2024) suggests that successful measurement instruments often draw from multiple theoretical perspectives to capture the complexity of digital cultural learning. This approach allows for a more nuanced understanding of how users engage with digital cultural content and how this engagement can be effectively measured.

The theoretical framework(s) ultimately selected will inform several key aspects of the study. As highlighted by Park et al. (2024), these include measurement instrument development, digital platform design considerations, and evaluation metrics. Their research emphasizes the importance of maintaining flexibility in theoretical application while ensuring methodological rigor.

Through careful analysis and synthesis of these theoretical perspectives, this study aims to develop a comprehensive understanding of how digital cultural heritage learning can be effectively measured and evaluated. This understanding will guide the development of measurement instruments that are both theoretically sound and practically applicable in the context of digital Wayang Kulit learning experiences. By integrating these perspectives, this study develops a conceptual framework that guides the design, implementation, and evaluation of UX measurement instruments for digital Wayang Kulit learning, ensuring they are both theoretically sound and practically applicable while capturing user engagement, learning effectiveness, and cultural authenticity.

### Conceptual Framework

The conceptual framework of this study examines how multiple systems interact to create effective digital learning experiences for Wayang Kulit. It integrates three main systems: traditional practitioners, who are the cultural knowledge holders and maintainers of authenticity; UX designers and platform developers, responsible for creating engaging and technically sound digital experiences; and users, representing modern audiences who learn, consume, and provide feedback (Wong & Abdullah, 2024; Pandey & Kumar, 2024). These systems are connected through two mediating tools: the digital platform, which translates traditional content into interactive formats, and the measurement instrument, which evaluates user engagement, learning outcomes, and cultural authenticity (Park et al., 2024; Rahman & Hassan, 2024). The framework emphasizes three key relationships: an interactive learning process where users engage with content and provide feedback, cultural preservation that balances tradition and innovation, and continuous improvement through iterative platform refinement (Liu & Park, 2024; Zhang & Liu, 2024; Ibrahim & Lee, 2024). By integrating insights from multiple theoretical perspectives, this framework guides the development of UX measurement instruments that are culturally authentic, user-centered, and adaptable, bridging traditional practices with modern digital learning experiences. Figure 1 illustrates the proposed conceptual framework along with its operational definitions.



**Figure 1.** Conceptual Framework for UX Measurement in Digital Wayang Kulit Learning Experience: Integration of Traditional Practice, Modern Learning, and Digital Development (Adapted from Jufry, 2023a; Kasinathan & Rahman, 2024; Rahman & Hassan, 2024)

## DISCUSSION

Digital cultural preservation has advanced considerably, especially in Malaysia. Recent studies highlight the distinct challenges and opportunities in using digital technologies to safeguard traditional art forms. For example, Wong & Abdullah (2024) note that local cultural nuances influence the success of digital preservation efforts, while Rahman and Hassan (2024) examine the challenges faced by Malaysian cultural institutions in adopting digital solutions. Innovative technologies such as augmented reality (AR) and virtual reality (VR) are increasingly recognized for their potential to sustain traditional arts (Ahmad & Nor, 2023; Smith, 2023).

The WAYANG EDU mobile app, developed by Fara Dayana Mohd Jufry (2023a), serves as the central case study for this research. The app effectively integrates cultural preservation, user engagement, and user-centered design, illustrating practical applications while addressing key research gaps.

The discussion is organized around five main themes: (i) digital cultural preservation, (ii) digital tools for engagement, (iii) theoretical frameworks in digital learning, (iv) UX design for cultural platforms, and (v) measuring digital learning experiences. Each section critically examines relevant theories and approaches, emphasizing their application in the Malaysian context and their potential relevance to the preservation of Wayang Kulit.

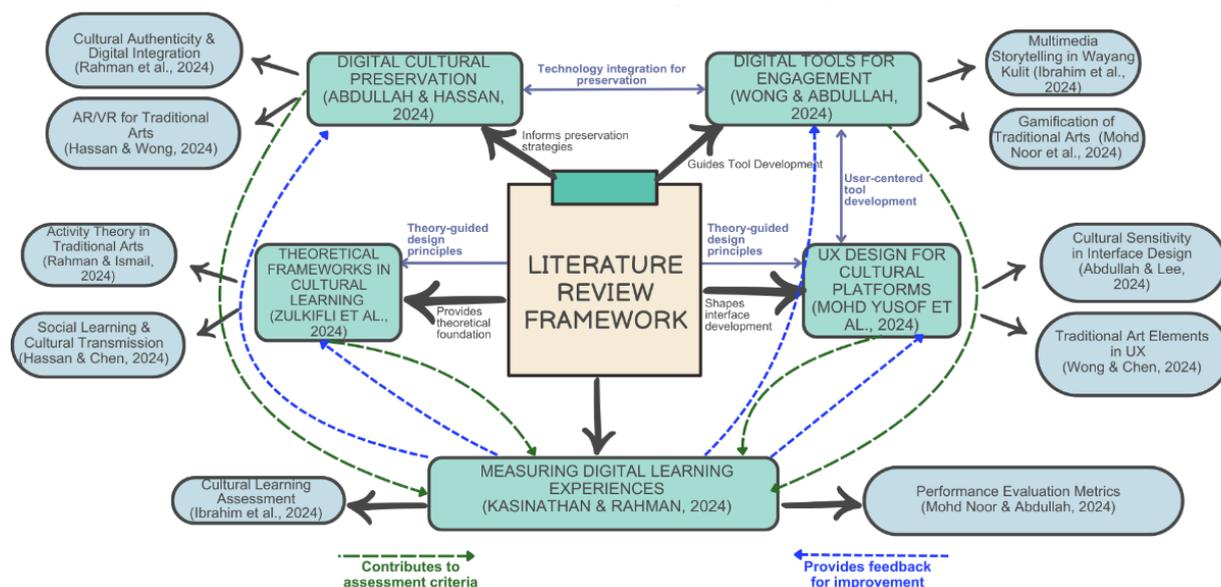
First, digital cultural preservation focuses on maintaining the authenticity of Wayang Kulit while enhancing accessibility through modern technology. Research by Wong and Abdullah (2024), Rahman and Hassan (2024), and Thompson and Wong (2024) highlights strategies for preserving traditional performance elements, spiritual aspects, and community engagement methods, providing insights relevant to the Malaysian context.

Second, digital tools for engagement, such as AR/VR technologies, interactive platforms, and gamification, are critical for attracting younger audiences. Studies by Ahmad and Nor (2023), Mohd Noor et al. (2024), and Pandey and Kumar (2024) demonstrate how these tools can balance technological innovation with cultural authenticity to improve audience interaction and learning outcomes.

Third, the use of theoretical frameworks like Activity Theory, Social Learning Theory, and Cultural-Historical Analysis provides a foundation for understanding how cultural knowledge can be transmitted through digital means. Rahman and Hassan (2024) and Choi and Seo (2024) emphasize their importance in guiding both research design and platform development.

Fourth, UX design for cultural platforms ensures that interfaces are user-centered, culturally sensitive, and reflect traditional aesthetics, as discussed by Choi & Seo (2024) and Wong and Abdullah (2024).

Finally, measuring digital learning experiences involves assessing user engagement, learning outcomes, and cultural authenticity, taking into account regional and demographic differences (Kasinathan & Rahman, 2024; Pandey & Kumar, 2024; Wong & Abdullah, 2024). Together, these concepts provide a comprehensive framework for designing, implementing, and evaluating effective digital platforms for Wayang Kulit, ensuring they are both educational and culturally authentic.



**Figure 2.** Framework showing the key concepts and their connections.

The relationships among these key concepts are organized in a framework, as depicted in Figure 2, showing the main themes and their connections.

The framework highlights five key areas central to this research: Digital Cultural Preservation, Digital Tools for Engagement, UX Design for Cultural Platforms, Theoretical Frameworks in Cultural Learning, and Measuring Digital Learning Experiences. Each area includes specific subthemes that guide the evaluation of existing studies.

This framework also serves as a roadmap for the literature review, showing how these themes come together to inform the development of user-centered and culturally sensitive digital tools, such as the WAYANG EDU app. The following sections discuss these themes in detail, supported by relevant literature.

## REMARKS AND FUTURE WORKS

The digitization and measurement of cultural learning experiences, particularly for Wayang Kulit, play a crucial role in preserving Malaysia's cultural heritage. Studies have shown that digital transformation can revitalize traditional art forms, making them more accessible and engaging for younger generations (Jufry, 2023b; Kasinathan & Rahman, 2024). Effective UX measurement instruments are essential for evaluating user engagement, learning outcomes, and maintaining cultural authenticity in digital platforms (Liu & Park, 2024; Pandey & Kumar, 2024).

The educational impact of this research extends beyond preservation, demonstrating that well-designed digital platforms can enhance cultural learning outcomes and foster meaningful engagement with traditional arts (Rahman & Hassan, 2024; Jufry, 2023b). Technological advancements, including immersive and interactive tools, offer opportunities to further improve digital cultural experiences while ensuring authentic representation (Kasinathan & Rahman, 2024).

From a policy perspective, systematic measurement can inform evidence-based decisions and funding strategies for cultural preservation initiatives (Thompson & Wong, 2023; Wong & Abdullah, 2024). Internationally, the frameworks developed for Wayang Kulit can serve as models for other cultural heritage projects, supporting global knowledge exchange (Park et al., 2024; Kasinathan & Rahman, 2024). Additionally, proper measurement tools can contribute to the economic potential of digital cultural initiatives, such as cultural tourism and educational resources (Rahman & Hassan, 2024).

Future work should focus on refining and validating UX measurement instruments, exploring their application across different cultural contexts, and integrating emerging technologies to enhance user engagement and learning outcomes. This research lays the foundation for evidence-based digital cultural preservation, advancing both theoretical understanding and practical implementation in cultural heritage education. This article explicitly presents a proposed study, its rationale, methods, and potential contributions.

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

## AUTHORS CONTRIBUTION

**Author:** Conducted initial review and prepared the initial draft of the manuscript.

## AVAILABILITY OF DATA AND MATERIALS

Data available within the article or its supplementary materials.

## DECLARATION OF GENERATIVE AI

The author declares that ChatGPT, a generative AI tool, was used to assist with language refinement and editing of the manuscript. All research ideas, data interpretation, and analyses remain the original work of the author.

## ETHIC STATEMENTS

This study received ethical approval from Universiti Pendidikan Sultan Idris Research Ethics Committee, ensuring that all research procedures complied with established ethical standards for research involving digital learning platforms and cultural content.

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