



My Loghat!: Design, Development, and Evaluation of a Mobile Multimedia Application for Malay Dialect Learning and Cultural Immersion in Tourism

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Research Article

Abstract:

As global tourism continues to expand, effective communication between tourists and local communities remains a persistent challenge. This paper presents the development and evaluation of My Loghat!, an interactive mobile e-learning application designed to teach Malay language dialects from four Malaysian states — Terengganu, Kedah, Sabah, and Perak — to tourists. Guided by the Multimedia Development Life Cycle (MDLC) methodology, the application integrated audio recordings of native dialect speakers, visual aids, culturally contextualised content (state history, traditional costumes, and notable places), and gamified quizzes. The system was implemented using Adobe Animate, Audacity, and Canva, and deployed as an Android APK. A structured evaluation was conducted involving two multimedia experts and 20 target users, assessed across three dimensions: content quality, effectiveness, and user satisfaction, using a four-point Likert scale. The results demonstrated strong overall acceptance, with 54.1% of target user responded at the 'Agree' level and 45.9% at 'Strongly Agree'. All responses were positive, indicating no disagreement with the application's features. The expert evaluations similarly yielded predominantly positive assessments. The findings suggest that My Loghat! represents a viable, accessible, and engaging tool for improving dialect comprehension and cultural immersion among tourists visiting Malaysia. The study contributes to the growing body of literature on mobile-assisted language learning (MALL) and cultural heritage preservation through technology.

Keywords: Dialect e-learning; Mobile-assisted language learning; Malay dialects; Cultural immersion; Tourism education

1. INTRODUCTION

Global tourism has expanded considerably in recent decades, positioning effective cross-cultural communication as a critical enabler of meaningful travel experiences. In Malaysia, millions of domestic and international visitors travel across diverse states each year, encountering regional communities whose daily interactions are conducted largely in local dialects rather than standard Bahasa Malaysia. Tourists who engage even minimally in these local dialects report deeper community connections, enhanced cultural appreciation, and more memorable travel experiences (1,2). However, dedicated resources for learning Malaysian state dialects remain scarce, as mainstream language learning platforms predominantly focus on standard Malay or major world languages, leaving a significant gap in dialect-specific content tailored to the tourist context.

The concept of e-learning, derived from "electronic learning," refers to the use of electronic devices and online platforms to deliver educational content remotely and asynchronously, allowing users to engage at their own pace and convenience (3). Within this broader landscape, Mobile-Assisted Language Learning (MALL) has emerged as a particularly productive paradigm, leveraging the ubiquity, interactivity, and multimedia capabilities of smartphones to support language acquisition outside formal classroom settings (4-6). Unlike desktop-based systems, MALL enables just-in-time learning in authentic contexts — a feature especially valuable for tourists who require language skills at the precise moment of cultural encounter. Research has consistently demonstrated that well-designed MALL tools improve vocabulary acquisition, pronunciation accuracy, and cultural competence across diverse learner populations (7, 8) with a meta-analysis of twenty years of MALL implementations confirming consistently positive learning outcomes across vocabulary, listening, and speaking domains (6).

Research trends in MALL indicate rapid growth since 2008, with vocabulary teaching remaining the dominant application area alongside listening and speaking skill development (8,9). Studies have also shown that applications combining audio, visual, and interactive elements outperform text-only resources in learner engagement and knowledge retention (7), a finding grounded in Mayer's Cognitive Theory of Multimedia Learning (CTML) (10). CTML proposes that learners process verbal and pictorial information through separate cognitive channels, and that learning is optimized when both channels are simultaneously engaged through complementary multimedia presentations. The modality, coherence, and contiguity principles derived from this theory have guided the design of numerous successful language learning applications, and directly inform the design rationale of the present work.

Regional dialects carry historical, social, and cultural significance that extends beyond mere linguistic variation (11). In Malaysia, dialects such as Terengganu Melayu, Kedah Melayu, Sabah Melayu, and Perak Melayu differ substantially from standard Bahasa Malaysia in phonology, vocabulary, and pragmatic use. The declining use of these dialects among younger generations, compounded by their underrepresentation in mainstream educational resources, has raised concerns about long-term cultural and linguistic heritage preservation (12). Digital technologies have been proposed as powerful vehicles for documenting and revitalizing minority languages, and interactive multimedia applications grounded in authentic audio recordings can contribute simultaneously to language learning and heritage preservation (12). Several existing resources for learning Malaysian dialects exist in the form of text-based websites, but these lack interactivity, audio guidance, mobile optimization, and structured learning progressions. Commercial platforms such as Ling App offer general Malay content but do not address regional dialectal variation, nor do they incorporate the cultural contextualization necessary for tourism-oriented learning. Table 1 presents a comparative analysis of existing systems against the proposed application.

Learner preparedness and usage patterns research further confirms that mobile devices are most effectively used for language learning when content is delivered in short, accessible modules suited to informal and fragmented learning schedules (13) precisely the conditions under which tourists engage with new language content during travel. Building on these theoretical and empirical foundations, this paper presents the design, development, and evaluation of My Loghat!, an interactive mobile e-learning application that introduces tourists to the dialects and cultural heritage of four Malaysian states: Terengganu, Kedah, Sabah, and Perak. Each module provides dialect vocabulary with native speaker audio pronunciation, state cultural background, traditional costume information, and tourism highlights, reinforced through an integrated gamified quiz. The remainder of this paper is structured as follows: Section 2 describes the research methodology and system design; Section 3 details the implementation; Section 4 presents the evaluation results and discussion; and Section 5 concludes the study with directions for future work.

Table 1. Comparison of existing systems with My Loghat!.

Feature	Dialect in Websites	Ling App	My Loghat!
Interactivity	Non-interactive	Interactive	Highly Interactive
Multimedia	Text only	Text&Audio	Text, Audio, Video&Images
Audio Pronunciation	None	Yes	Yes
Cultural Content	No	No	Yes
Quiz Feature	No	Yes	Yes
Mobile Support	Partial	Yes	Yes (APK)
Target Audience	General Public	Language Learners	Tourists
Languages	Malay only	Multiple	English&Malay

2. METHODOLOGY

2.1 Research Design

This study adopted a development research approach, combining iterative software development with user evaluation. The Multimedia Development Life Cycle (MDLC) was selected as the guiding framework due to its suitability for multimedia product development and its structured iterative phases: Analysis and Planning, Design, Content Creation, Development, Testing, Deployment, and Evaluation and Maintenance (14). This cyclical framework ensures continuous quality assurance and alignment between instructional goals and system features throughout the development process.

2.2 System Design and Development

The application covers four Malaysian states, each represented by a dedicated module containing four content sections: (i) State History, (ii) Traditional Costumes, (iii) Notable Places, and (iv) Dialect Vocabulary. Each vocabulary item is presented on a flashcard-style screen displaying a relevant illustration, the dialect term, its standard Malay equivalent, an English translation, and an audio pronunciation button. A fifth module provides an integrated Quiz section testing users on vocabulary items across all four states.

Adobe Animate was used as the primary development environment, selected for its robust support for interactive animations, button-triggered audio playback, and cross-platform export capabilities including Android APK packaging. Graphic assets were produced using Canva and sourced from the Freepik library under free-use licenses. Audio recordings of dialect vocabulary were captured using Audacity at 44.1 kHz with noise reduction post-processing applied to ensure clarity.

Storyboarding was conducted prior to development to define the navigational flow and screen layouts. The application architecture follows a hierarchical structure: a splash screen leads to a main menu from which users navigate to individual state modules or the quiz. Within each state module, sub-menus allow access to the four content categories. Navigation controls (Back, Next, and Home) are accessible on all screens.

The quiz module presents eight multiple-choice questions per state, drawn from vocabulary covered in the dialect sections. Each question includes four answer options with immediate visual feedback (correct in green, incorrect in red). A countdown timer adds a gamification element and encourages timely response. Final scores are displayed at the conclusion of the quiz.

2.3 Evaluation Methodology

The evaluation employed a structured questionnaire designed to assess three quality dimensions: Content Quality, Effectiveness, and User Satisfaction. A four-point Likert scale was adopted (1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree), with the deliberate omission of a neutral midpoint to encourage evaluators to commit to a directional opinion (15). Table 2 presents the complete set of evaluation items.

Table 2. Evaluation questionnaire items by category.

No.	Evaluation Item	Category
1	This application follows the principles of multimedia.	Content
2	The content is straightforward and easy to learn.	Content
3	The voice pronunciation is clear and appropriate.	Content
4	Content arrangement makes delivery of information more effective.	Content
5	Using this application is more convenient compared to dialect websites.	Effectiveness
6	Mixing multimedia components assists users in efficiently receiving information.	Effectiveness
7	The information is able to have impact on the users.	Effectiveness
8	The application could increase public awareness of dialect and cultural immersion.	Effectiveness
9	This application allows access to features and services from any place and at any time.	Satisfaction
10	Readability of text is clear and easy to understand.	Satisfaction
11	This application is user-friendly.	Satisfaction

Two evaluation groups participated in the study. The first comprised two multimedia experts with professional backgrounds in instructional technology and IT systems, tasked with assessing technical quality, multimedia design principles, and information architecture. The second group consisted of 20 target users (tourists and individuals interested in Malay culture), who evaluated usability, content accessibility, and overall satisfaction. The sample size for the target user group consists of usability evaluation guidelines, which indicate that 20 participants are sufficient for reliable quantitative usability assessments (15). Testing was conducted online using a shared APK link and a Google Forms questionnaire, enabling remote participation.

3. IMPLEMENTATION

The implementation phase translated the storyboard designs into a fully functional Android application. Media production proceeded in three parallel streams: text and graphic content creation in Canva and Adobe Animate; audio recording and editing in Audacity; and video sourcing from copyright-free online repositories. All media assets were subsequently imported into Adobe Animate for integration.

Interactive elements — navigation buttons, audio playback triggers, quiz answer selectors, and the quiz timer — were implemented using Adobe Animate's ActionScript 3.0 scripting environment. The quiz timer was coded as a decrementing counter with an event listener that terminates the quiz and displays the final score when the timer reaches zero. Answer buttons were scripted to reveal feedback overlays and advance the question frame.

The complete application was exported in Android APK format for distribution during testing. The APK was compatible with Android devices running version 7.0 (Nougat) and above, encompassing a broad range of contemporary smartphones. The final application comprised five primary modules (four state modules and one quiz module), totaling over 150 individual screens. Figure 1(a)–(d) shows the application's GUI.

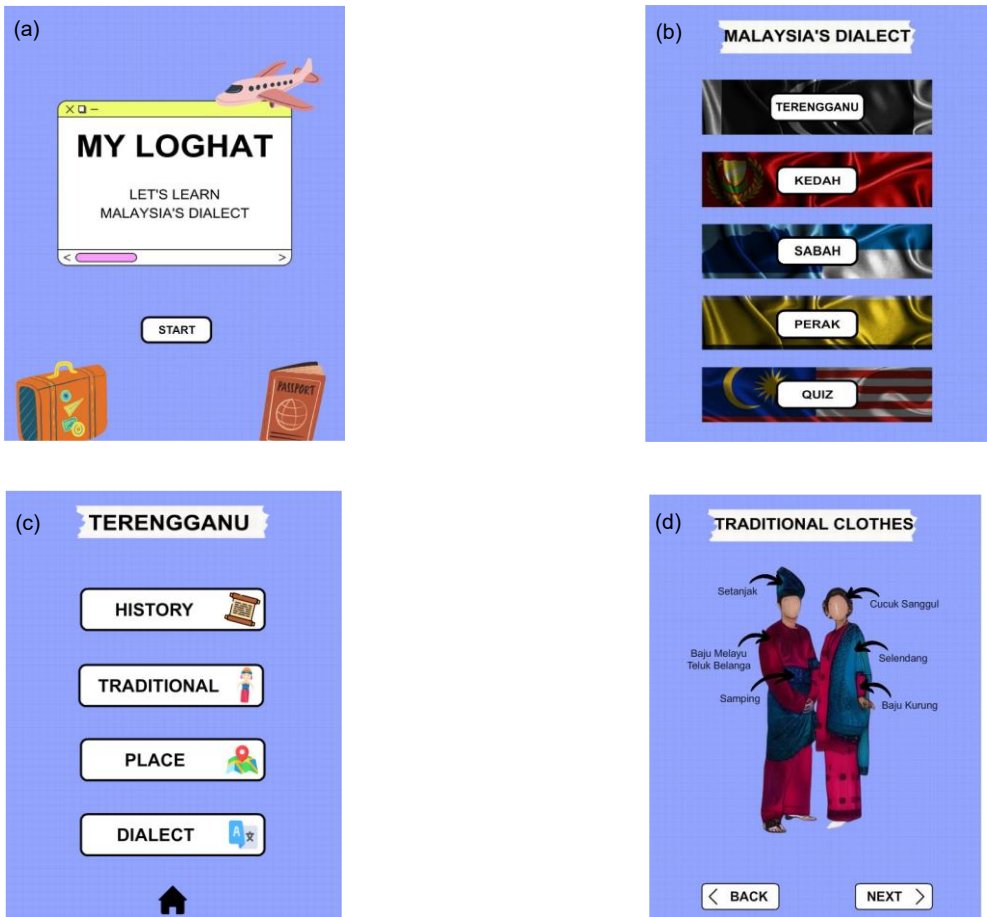


Figure 1. Graphical user interface of My Loghat! application: (a) front loading page; (b) main menu page; (c) Terengganu landing page; and (d) Terengganu traditional costume page.

4. RESULTS AND DISCUSSION

4.1 Demographic Profile of Respondents

The target user group comprised 20 respondents, and their demographic profile is summarized in Table 3. Young adults aged 18–24 made up three quarters of the sample, and students formed the largest occupational group. This profile matches the audience the application was designed for: younger travelers and dialect-curious individuals who are already accustomed to learning through their mobile devices.

Table 3. Demographic profile of target user respondents (n = 20).

Characteristic	Category	Frequency (n)	Percentage (%)
Age group (years)	18–24	15	75.0
	25–44	5	25.0
Gender	Female	12	60.0
	Male	8	40.0
Occupation	Student	14	70.0
	Private sector employee	3	15.0
	Unemployed	3	15.0

The two multimedia experts were female professionals aged 25–44 and 45 and above respectively, with between 1–3 and more than 5 years of experience in multimedia and information technology. Their varied experience levels provided complementary perspectives on technical quality and user experience design.

4.2 Target User Evaluation Results

Table 4 summarizes the aggregated responses from the 20 target users across all three evaluation categories. The scoring reflects the total number of individual question responses across all items within each category.

Table 4. Summary of target user evaluation results (n = 20).

Category	Strongly Disagree	Disagree	Agree	Strongly Agree
Content	0 (0%)	0 (0%)	38 (47.5%)	42 (52.5%)
Effectiveness	0 (0%)	0 (0%)	42 (52.5%)	38 (47.5%)
Satisfaction	0 (0%)	0 (0%)	39 (65.0%)	21 (35.0%)
Total	0 (0%)	0 (0%)	119 (54.1%)	101 (45.9%)

No respondents selected Strongly Disagree or Disagree for any item, indicating unanimous positive acceptance of the application. For the Content category, 52.5% of responses were Strongly Agree, reflecting strong confidence in the accuracy, clarity, and appropriateness of the dialect and cultural content. The voice pronunciation clarity item received the highest proportion of Strongly Agree responses (65%), underscoring the effectiveness of native speaker recordings produced and processed through Audacity.

The Effectiveness category yielded a slightly higher proportion of Agree responses (52.5%), suggesting that while users acknowledged the application's utility over existing web-based resources, there is perceived potential for further enhancement in learning impact. The item concerning graphical and textual appeal attracted the highest proportion of Strongly Agree responses in this category (60%), confirming that the visual design strategy employing Canva graphics and illustrative vocabulary cards was well-received.

Satisfaction results showed 65% Agree and 35% Strongly Agree. User-friendliness attracted the highest Strongly Agree proportion, and the accessibility item — permitting use at any time and place — received 60% Agree responses, consistent with the core MALL proposition that mobile applications support on-demand learning during travel. These overall satisfaction scores are comparable to benchmarks reported in mobile educational application evaluation studies (15).

4.3 Multimedia Expert Evaluation Results

Table 5 presents the aggregated responses from the two multimedia experts.

Table 5. Summary of multimedia expert evaluation results (n = 2).

Category	Strongly Disagree	Disagree	Agree	Strongly Agree
Content	0	0	6 (75%)	2 (25%)
Effectiveness	0	0	4 (50%)	4 (50%)
Satisfaction	0	1 (33.3%)	4 (44.4%)	1 (11.1%)
Total	0	1 (4.5%)	14 (63.6%)	7 (31.8%)

Expert evaluation of Content quality was strongly positive, with 75% of responses at the Agree level and 25% at Strongly Agree, indicating solid adherence to multimedia design principles and effective information structuring. The voice pronunciation item, in particular, received 100% Strongly Agree from both experts, reinforcing the high audio quality achieved through the Audacity recording and editing pipeline.

The Effectiveness category produced an equal split between Agree and Strongly Agree (50% each), with experts recognizing the application's clear advantage over static web-based dialect resources. The single Disagree response in the Satisfaction category — directed at the anytime/anywhere access item — was attributed by the expert to the limitation of the application being distributed as a standalone APK requiring manual installation, rather than being available through an official app store. This represents a priority area for future deployment.

4.4 Comparative Analysis and Discussion

Comparing the two evaluator groups, both demonstrated a predominance of positive responses with no Strongly Disagree selections. The target users' aggregated 100% positive response rate is consistent with prior MALL application evaluations that report high user acceptance when content is contextually relevant, visually engaging, and functionally

reliable (5, 13). The expert group's more distributed responses across Agree and Strongly Agree categories reflect their more critical technical assessment, which is characteristic of expert evaluation methodologies (15).

The results align with Mayer's CTML principles (10), confirming that the combination of visual vocabulary cards, native audio pronunciation, and cultural imagery creates a learning environment that engages both verbal and visual cognitive channels. The high ratings for content accuracy and voice clarity support the use of native speaker recordings over synthetic text-to-speech systems for dialect learning applications, consistent with findings across MALL research (7,8).

Compared to existing solutions (Table 1), My Loghat! addresses several critical gaps: dialect-specific audio for four Malaysian states, culturally enriched contextual modules, and an interactive quiz system. These features collectively position the application as a more comprehensive cultural and linguistic resource for tourists than currently available alternatives. Certain limitations were nonetheless identified. The breadth of dialect vocabulary within each state module is modest, covering only a curated selection of common words and phrases. Expert feedback indicated that expanding vocabulary coverage and adding interactive dialogue scenarios would significantly enhance practical utility.

A second limitation concerns the video content. Videos that played correctly during desktop preview in Adobe Animate failed to load once the project was packaged as an APK. The root cause was traced to path handling rather than codec support or runtime permissions: the video components referenced external files through absolute paths on the development machine, and these files were not bundled into the application package by the AIR packager. At runtime on Android, the hard-coded paths could not be resolved, so the video screens loaded without their media. Because of this, the video component was excluded from the version distributed to evaluators, and the user satisfaction ratings reported in Sections 4.2 and 4.3 reflect the application without its video content. The planned fix for the next release is to embed the videos as bundled assets referenced through relative, package-internal paths, with remote streaming as a fallback option; both are established workarounds for this known constraint in Adobe Animate and AIR deployments. Developers building similar multimedia applications in Adobe Animate should verify external asset references against the packaged build early, since the desktop preview does not expose this class of error.

The scale of the expert evaluation should also be acknowledged. Only two multimedia professionals took part, as these were the domain experts available to the project within the evaluation period, and the exercise was intended as a pilot expert review rather than a statistically generalizable assessment. A panel of this size limits the generalizability and statistical reliability of the expert-based technical findings, although their ratings were consistent with those of the 20 target users, which lends some confidence to the overall picture. Follow-up studies should engage a larger and more diverse panel of experts, ideally spanning instructional design, linguistics, and mobile user experience, to validate the application's technical and instructional design quality more rigorously.

Platform coverage is a further constraint, and a relevant one given the tourist audience. The application is currently distributed only as an Android APK, so iPhone users cannot install it at all; iOS does not permit sideloading of Android packages, and no iOS build has yet been produced. Huawei devices shipped without Google Mobile Services raise a related issue: they can still install the APK directly, but they cannot access the Google Play Store, so the planned Play Store release alone would not reach them. International tourists carry a wide mix of devices, and these gaps narrow the audience the application can serve. Addressing them will require an iOS version, possibly through a cross-platform framework such as Flutter, and distribution through alternative channels such as Huawei AppGallery.

5. CONCLUSION

This paper has presented the development and evaluation of My Loghat!, an interactive mobile application for learning Malay language dialects tailored to tourists. The application integrates native audio pronunciation, culturally contextualized content, visual vocabulary flashcards, and gamified quizzes for four Malaysian states. Guided by the MDLC framework and Mayer's multimedia learning principles, the development process produced a functional, user-friendly Android application evaluated positively by both target users and multimedia experts.

Evaluation results demonstrated strong user acceptance across all three dimensions — content quality, effectiveness, and user satisfaction — with no negative responses recorded from target users. Expert assessments corroborated the high audio quality and adherence to multimedia design principles. These findings support the conclusion that My Loghat! constitutes a viable and effective tool for dialect-based cultural immersion in the context of Malaysian tourism.

Future work will focus on expanding vocabulary coverage for each dialect, resolving the embedded video playback limitation described in Section 4.4, implementing cloud-based content updates, and publishing the application through the Google Play Store to improve accessibility. Cross-platform support is planned alongside the Play Store release so that iPhone users, and Huawei users without access to Google services, are no longer excluded. On the evaluation side, subsequent studies should engage a larger and more diverse panel of expert evaluators than the two-person pilot panel used here, to further validate the application's technical and instructional design quality. Progressive integration of speech recognition technology to provide automated pronunciation feedback would further advance the application's pedagogical value, and longitudinal studies assessing actual language acquisition outcomes among tourist users are recommended to validate the application's long-term effectiveness.

AUTHORSHIP CONTRIBUTION STATEMENT

Hamzah Asyrani Sulaiman: supervision, methodology, writing – review & editing; Ainul Sofiya Khairuddin: conceptualisation, application design, development, data collection, writing – original draft; Che Ku Nuraini Che Ku Mohd: writing – review & editing; Abdullah Bade: writing – review & editing; Iznora Aini Zolkifly: writing – review & editing.

DATA AVAILABILITY

The evaluation data that support the findings of this study are available from the corresponding author upon reasonable request.

DECLARATION OF COMPETING INTEREST

The authors declare no conflict of interest.

DECLARATION OF GENERATIVE AI

Generative AI tools (Claude by Anthropic) were used in this study solely for language paraphrasing, grammatical refinement, and improving the clarity of written expression. All intellectual content, research design, data collection, analysis, and conclusions presented in this manuscript are entirely the work of the authors. The use of AI assistance in this manuscript complies with the ethical guidelines for AI-assisted academic writing.

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