Gamified Language Learning: Preserving Regional Dialects through Interactive Digital Platforms - A Case Study of the Kelantanese Dialect

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Abstract: The dynamic Kelantanese prioritise their dialect over anything else. It encourages regional traditions, mythologies, and historical narratives through song, dance, and drama. The dialect significantly influences Kelantanese social life, customs, and religion, providing speakers with a profound sense of identification and belonging. This distinctive cultural asset confronts significant difficulties. The Kelantanese dialect is under threat due to the younger generations' transition to standard Malay and the absence of formal educational resources. The extensive use of media and communication technology generates apprehensions regarding linguistic uniformity, potentially undermining the Kelantanese dialect. To address these issues, this study focuses on the development and implementation of DialectMaster, a gamified web application designed to facilitate the learning of the Kelantanese dialect. By integrating engaging elements such as quizzes, progress tracking, and leaderboards, the application enhances user experience and learning outcomes. Technically, PostgreSQL was chosen for its reliability, with Drizzle ORM ensuring seamless database interactions and Next.js optimising server-side functionalities. Security was prioritised, resulting in the adoption of Clerk for authentication and encryption, thereby safeguarding data and enhancing user trust. Incentives such as points, badges, leaderboards, and quests were essential for prolonged engagement, while culturally pertinent content enhanced the relatability of the learning experience. The iterative development process employed agile methods incorporating AI-driven features, gamification aspects, and an intuitive user interface (UI), resulting in a dynamic tool for learning the Kelantanese dialect. The research highlights the advantages of gamification in education, illustrating how interactive components can enhance learner motivation and retention. DialectMaster emerges as a promising instrument for dialect acquisition, underscoring the significance of user-centred designs and gamified learning environments, with effective implementation and favourable user feedback accentuating its capacity to render the Kelantanese dialect enjoyable and accessible to learners.

Keywords: Agile development, AI-driven features, Gamification, User-centered designs, Web application

1 Introduction

Tourism is a social, cultural, and economic phenomenon that involves individuals travelling to other places or locations beyond their typical surroundings for personal or business/professional reasons. In this globalisation era, consider how recent and developing advancements in information and communication technology (ICT) may affect how tourism companies and organisations connect with and manage their visitors. The tourism industry not only contributes significantly to gross domestic product (GDP), but it also plays an essential role in terms of job creation, poverty reduction, income

distribution, increased demand for products and services, additional tax revenues, and foreign exchange reserves for governments.

With increased globalisation and opportunity, most countries are using a variety of strategies to achieve their economic growth objectives, and tourism has emerged as one of the most important tools for accomplishing this goal. These studies have advanced tourism demand knowledge from a variety of perspectives by mapping tourism economics knowledge [1], commenting on the inertia of the tourism-led economic growth hypothesis [2], assessing the methodological evolution and prospects of tourism demand forecasting [3], and debating critical issues in econometric tourism demand studies [4].

In Malaysia's northeastern state of Kelantan, the dialect is strongly established in the culture and reflects the area's rich historical past. This dialect is a unique blend of Malay, Thai, and indigenous traits shaped by centuries of interaction with adjacent civilisations, trading routes, and traditional practices [5].

The dynamic Kelantanese society values its dialect above anything else. It promotes regional tradition, legends, and historical narratives in music, dance, and drama. The dialect also plays a major role in Kelantanese social life, ceremonies, and religion, giving speakers a strong sense of identity and belonging. Kelantanese culture is represented in the dialect, an intangible cultural property [5,6].

However, this unique cultural treasure faces huge challenges. The Kelantanese dialect is threatened by younger generations' shift to standard Malay and lack of structured learning opportunities [5]. The widespread use of media and communication technology raises concerns about language standardisation, which may weaken the Kelantanese dialect.

Based on the available census information up to 2020, there are no official specific figures regarding the number of people who are not originally from Kelantan but reside in the state. However, the overall population of Kelantan is around 1.9 million people. Migration to Kelantan includes university students, workers from specific sectors (such as oil and gas, or public servants assigned to the state), and residents from other states who move to Kelantan for work or family reasons. However, there is no specific data that indicates how many of Kelantan's residents are originally from outside the state. The Kelantanese tongue is an important part of Malaysia's cultural mosaic, but it is at a crossroad and faces a dangerous future because of several important problems. At its core is the lack of easy-to-find and interesting materials that are needed to learn and use this unique language history. This lack of tools has a big impact on both non-Kelantanese students, workers, and tourists who want to learn more about Kelantanese culture but are having trouble mastering the language.

Making things even more difficult is the fact that these tools are also hard to get. The only places you can find learning tools for the Kelantanese dialect are in real life, like libraries and language centres. This restriction makes it very hard for learners who want to access the materials from afar and learn at their own pace and ease. These problems have effects that go far beyond what we can see. The possible loss of the Kelantanese dialect not only threatens the variety of languages spoken but also the very core of Kelantanese society. It puts at risk the customs, folklore, and historical stories that are part of the dialect. This weakens the cultural fabric that holds the Kelantanese community together. For tourists, it makes their cultural experience less real and takes away their chance to really experience Kelantanese traditions.

In response to these challenges, the development of Kelantan DialectMaster emerged as an important initiative. This innovative and gamified learning platform seeks not only to preserve the Kelantanese dialect but also to promote cultural appreciation and bridge the gap between tradition and modernity. By providing an accessible and engaging platform for learning, Kelantan DialectMaster aims to empower learners, both within the Kelantanese community and among enthusiasts worldwide, in their journey to explore and embrace this unique linguistic and cultural heritage.

2   Related Research

A   *Gamification Features for Mobile Language Learning*

Gamification is a good way to help people learn languages. Duolingo is one of the most well-known gamified language learning apps. Adding game-like elements like difficult tasks, rewards, levels, and user ranking based on achievements can create an engaging environment that boosts language skills and confidence and has a positive impact on student behaviour, commitment, and motivation [7].

Adding game-like features to language learning can also help students learn how to solve problems and keep their attention. Some gamification aspects that are usually seen in a good light are leaderboards, badges, streaks, experience points, and the use of lingots [8].

In this way, using games to teach Kelantan speech to visitors and students can be helpful. Students can be more driven to learn and remember the language if they use game-like factors in the learning process. A more interesting and dynamic learning experience can also be made with gamification. This can be especially helpful for guests who want a more immersive experience.

This method of using games to help people learn languages has been shown to work overall. Using game features when teaching the Kelantan accent can be a helpful way to make learning more fun for both tourists and students.

B   *E-Commerce in Tourism Enterprises*

Gamification has been discovered as a powerful method for improving learning experiences in a variety of domains, including language learning. It can improve learning outcomes by increasing motivation, engagement, and enjoyment [9], [10]. This is especially important in language learning, as learners may struggle with motivation and engagement due to the task's complexity and difficulty.

In addition, gamification can also be used to improve the visitor experience and increase cultural learning in the context of tourism. Technology may be used to provide immersive and interactive experiences for tourists, allowing them to engage more meaningfully with the local culture and language [11]. This is particularly significant for Kelantan, which possesses a unique dialect and cultural heritage that might be emphasised through gamification.

Overall, gamification has the potential to improve the learning experience for visitors and students learning the Kelantan dialect. By developing this gamified learning platform, learners can enhance their connection with the local dialect and cultures, which also facilitates the interaction between them and the local residents.

C   *Interactive Multimedia for Promoting Cultural Heritage Tourism*

Interactive multimedia is progressively utilised to enhance user engagement and motivation across various sectors, including education and tourism. The utilisation of multimedia components in non-multimedia settings is able to stimulate and engage users. It has been demonstrated to enhance learners' motivation, engagement, and academic outcomes in the realm of language acquisition.

Multimedia interaction has been employed in the tourism industry to enhance travellers' experiences and engagement with the destination. The elements for interactive multimedia, including virtual tours, films, and music, can enhance travellers' involvement and loyalty to a destination [12].

In the context of the Kelantan dialect, interactive multimedia can be a helpful tool for tourists and students to learn about and interact with the local culture and language. Because the Kelantan dialect

is unique and distinct in Malaysia, interactive multimedia can aid in making the learning process more enjoyable and engaging for students. Furthermore, interactive multimedia can serve to promote Kelantan's local culture and heritage to tourists, which can improve their overall experience and contentment with the area.

In summary, interactive multimedia can be a beneficial tool in the tourism business for boosting language learning and cultural heritage. By introducing interactive multimedia components into your Kelantan dialect website for tourists and students, you may increase user engagement and motivation while also promoting Kelantan's native culture and heritage.

D   Mobile-Assisted Language Learning (MALL) using Task-Based Approach and Gamification

Gamification may be utilised to create a competitive environment that increases learners' motivation and critical thinking, claim [13]. It has been demonstrated that gamification increases students' enthusiasm and interest in language learning as well as their acceptance of e-learning and m-learning [14][15]. In the current study, EFL students' writing abilities were enhanced using gamification and task-based learning using a mobile application [16]. These results imply that gamification and task-based learning combined may be a useful strategy for improving language learning results.

Gamification and task-based learning can be used to create an interesting and interactive learning environment for users on a website dedicated to teaching the Kelantan dialect. Through the use of interactive components like badges, prizes, and points, the website can encourage users to interact with the content and acquire the dialect in an enjoyable manner. Furthermore, users can apply what they have learnt in real-life scenarios by using a task-based approach to give them real-world writing and speaking tasks [7].

All things considered, the creation of a website for learning the Kelantan dialect can benefit from the application of gamification and task-based learning [17]. The website can assist users in developing their language abilities and obtaining a deeper understanding of the dialect and its cultural background by offering an exciting and interactive learning experience [16].

3   Methodology

DialectMaster, a language learning web application aimed at growing Kelantanese dialect expertise, has reached a tipping point. A solid and flexible methodology is essential for ensuring long-term success and flexibility in the dynamic language learning landscape. This chapter describes the framework adopted for DialectMaster's development and expansion using Agile methodology, as shown in Figure 1 [21].
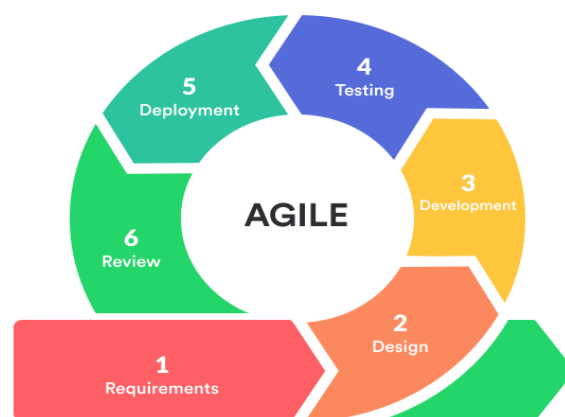

Figure 1: Agile Phases

The Agile technique, which emphasises user-centred design, iterative development, and continuous improvement, is a perfect fit with DialectMaster's primary goals. It provides a foundation for creating a dynamic learning environment that is adapted to the various needs and preferences of users, all the while encouraging a culture of continuous innovation and development.

The goals of DialectMaster are well aligned with the agile methodology's emphasis on flexibility and adaptability, particularly with regard to its iterative development and constant feedback approach. It will be able to quickly prototype and test new features with this technique, obtaining insightful user input early in the development process [18]. With this proactive approach, DialectMaster will continuously adapt to its consumers' ever-changing demands.

The development of the website application, DialectMaster, is aimed at facilitating the learning of the Kelantanese dialect for tourists and students unfamiliar with the dialect, will be guided by Agile methodology. Agile practices, which point out adaptive planning, evolutionary development, early delivery, and continual improvement, are particularly well-suited for this project [19].

Agile approaches place a significant value on modification and agility. This is particularly useful when developing a language learning application, as it allows you to incorporate new insights and feedback from users as well as adapt to the unique challenges of teaching a dialect to non-native speakers [20].

Agile methodology highlights close collaboration between developers, stakeholders, and users. This collaborative environment can facilitate effective communication with Kelantanese language experts, educators, and the target audience, ensuring that the application's content and features are accurate, relevant, and engaging [21].

The adaptive planning aspect of Agile methodology will allow for the integration of feedback and insights from users, enabling the project to adjust its plans and features to better meet the needs of the users. Furthermore, the iterative and incremental development encouraged by Agile will facilitate the continuous improvement and refinement of the application based on user feedback. Early delivery of working software will enable a prompt provision of a basic version of DialectMaster to users for feedback and validation, ensuring that necessary adjustments can be made early in the development process. Finally, the Agile methodology's focus on continual improvement will foster a culture of ongoing enhancement, allowing the application to remain responsive to user needs and feedback [19].

By leveraging Agile methodology, the development of DialectMaster will be characterised by a dynamic and user-centric approach, ensuring that the application evolves in response to user needs and feedback. This iterative process will ultimately lead to the creation of a more effective and engaging learning experience for tourists and students in Kelantan.

A System Requirements

Table 1: Hardware Requirement Table

Category	Requirement	Client-side (Website)	Client-side (Smartphone)
Processor	Modern CPU with at least 2 cores	N/A	Modern CPU (compatible with chosen platform)
RAM	4 GB RAM	N/A	Sufficient RAM for smooth performance
Storage	Sufficient space for browser cache and temporary files	N/A	Adequate storage for app installation and data

Operating System	Any modern desktop/mobile OS with recent web browser	N/A	Any platform with web browser (Chrome, Safari, Firefox, etc.)
Internet Connection	Stable internet connection with sufficient bandwidth for audio/video streaming	N/A	Mobile network or Wi-Fi

Table 2: Software Requirements (Client-side)

Category	Requirement	Website	Smartphone (optional Mobile App)
Web Browser	Compatibility with major browsers (Chrome, Firefox, Safari, Edge)	✓	N/A
JavaScript Libraries/Frameworks	React, Angular, or similar for efficient development and interactive UI	✓	N/A
Media Player and Codecs	Support for various audio/video formats (MP3, AAC, MP4)	✓	N/A
Accessibility Features	Keyboard navigation and screen reader compatibility	✓	Touchscreen optimisation, mobile-friendly navigation
Text size and color customization	Adjustable text size and color contrast	✓	Adjustable text size and color contrast

Table 3: Software Requirements Table (Server-side)

Category	Requirement	Details
Web Server	Reliable and scalable web server	Next.js and Server actions
Database	Secure database	PostgreSQL
Programming Languages/Frameworks	Depending on project complexity	Node.js, Next.js, Stripe, ShadcnUI, Tailwind, React.js

B *Functionalities and Performance*

A use case diagram of DialectMaster is shown in Figure 2, representing the interactions between users (actors) and the system, showcasing the functionalities and features offered by the system.
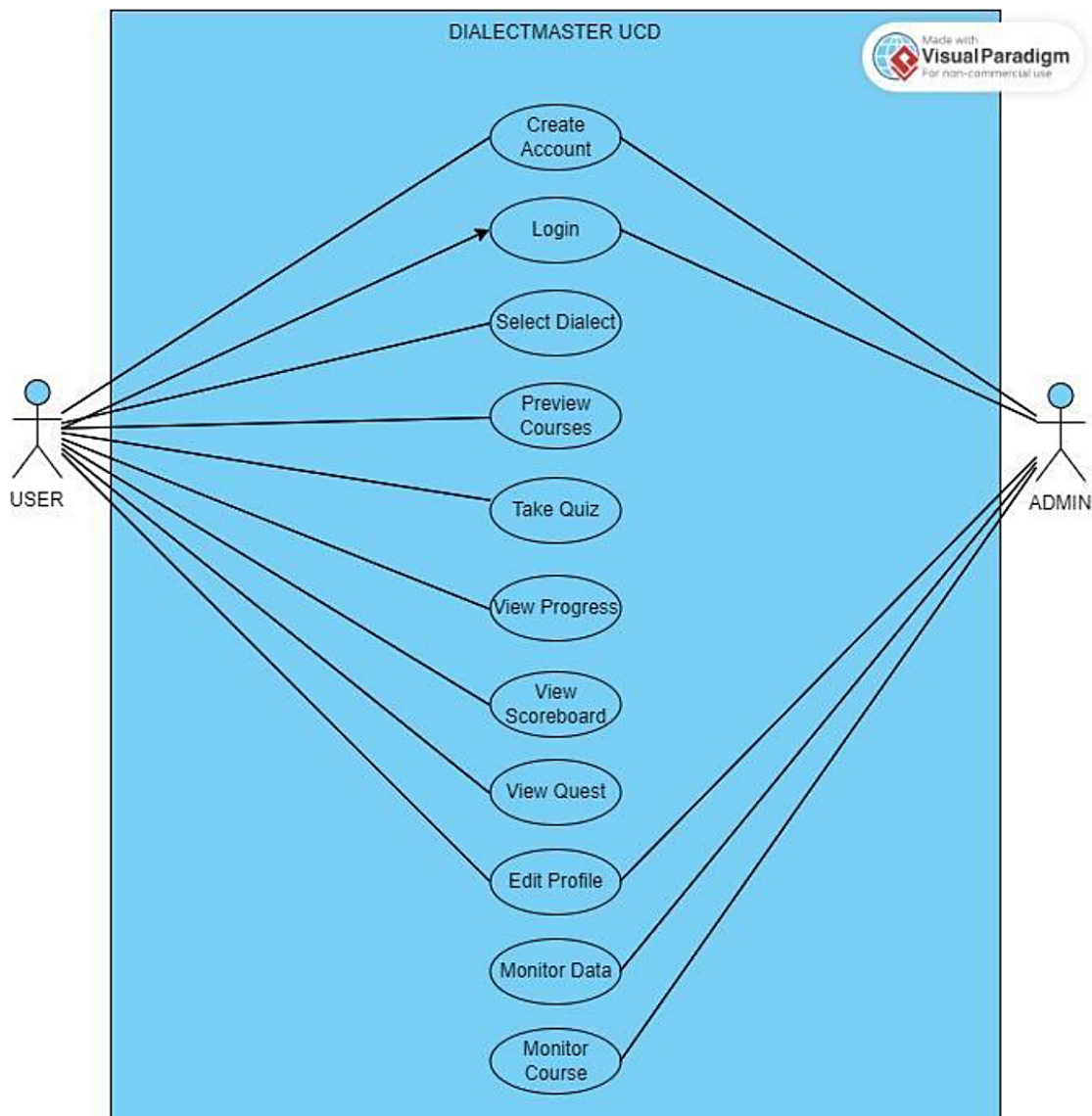
Figure 2: Use Case Diagram

Use Case 1: User Account Management
1.1 Users can register with a Gmail account.

Use Case 2: User Authentication
2.1 Both users and administrators can log in and out securely.

Use Case 3: Language Selection
3.1 Users can choose the dialect they want to learn.

Use Case 4: Lesson Preview
4.1 Users can preview lesson content before taking quizzes.

Use Case 5: Quiz Taking
5.1 Users can test their understanding of lesson material with various question formats.
5.2 Users can go to the next challenges after finishing the previous challenges.
5.3 Users can re-answer the answered challenges to gain heart.

Use Case 6: Progress Tracking
6.1 Users can track their progress and achievements through points, leaderboard, and heart.

Use Case 7: Scoreboard Viewing

7.1 Users can see their ranking compared to other users based on performance metrics.

Use Case 8: View Quest

8.1 Users can discover quests.

Use Case 9: Profile Management

9.1 Users can update their profile photo and change their email address.

9.2 Users can access their own profile.

9.3 Users can delete their account if they choose to.

Administrator Use Cases

Use Case 10: User Data Analysis

10.1 Administrators can access and analyse user progress data to improve the platform.

Use Case 11: Course Management

11.1 Administrators can add new courses with units, lessons, and challenges.

11.2 Administrators can edit courses with units, lessons, and challenges.

11.3 Administrators can delete courses with units, lessons, and challenges.

4   Results

The implementation of the DialectMaster web application involved a structured and iterative development process using the agile methodology. Utilising Next.js 14 for its robust server-side capabilities and Drizzle ORM for efficient database management with PostgreSQL, the development team successfully integrated AI-driven features, interactive gamification elements, and a user-friendly interface. Key features such as AI voices from Elevenlabs, a comprehensive authentication system via Clerk, and a responsive design with Tailwind CSS were implemented to ensure an engaging and secure learning experience. The platform's deployment on Vercel facilitated seamless scaling and performance optimisation, ultimately resulting in a dynamic and immersive tool for learning the Kelantanese dialect.
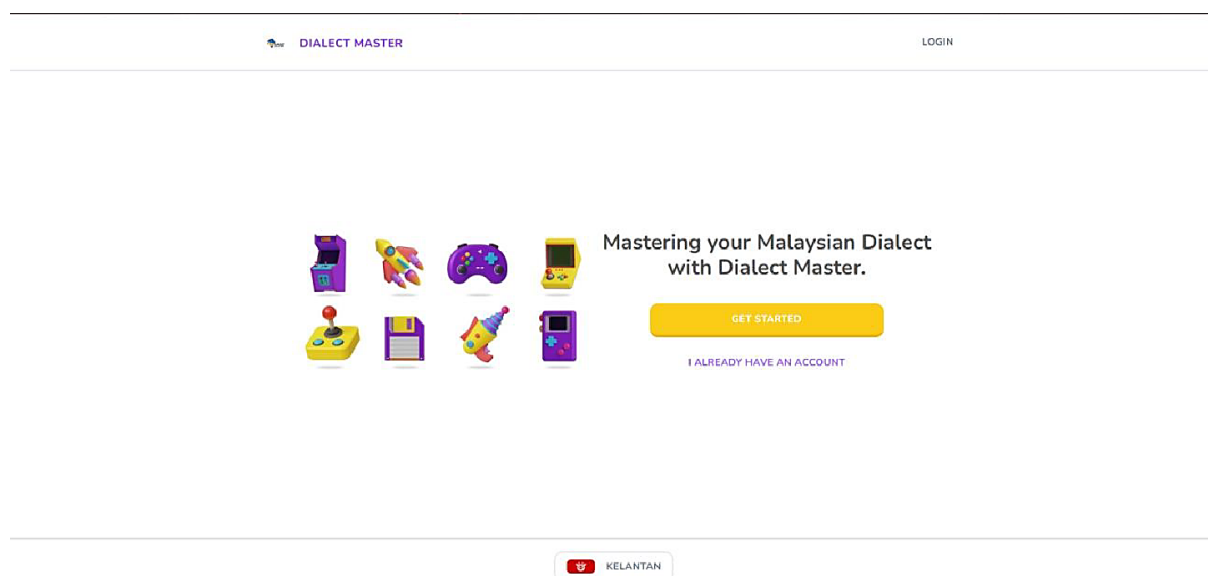
A   Landing Page

Figure 3: Landing Page

The landing page, as shown in Figure 3, features a clean and minimalist layout with a central focus on the application's purpose: "Mastering your Malaysian Dialect with Dialect Master." The prominent "Get Started" button invites new users to begin their journey, while the "I Already Have an Account" option allows returning users to log in easily. The use of colourful icons related to dialect learning and gaming adds a playful and engaging element to the interface, making it appealing to a wide range of users. The design ensures that essential functions are easily accessible, enhancing the overall user experience.

The Google login interface for the DialectMaster web application is designed for ease and convenience, offering users the option to create an account or log in using their Google credentials. The clean and straightforward design, with a modal window prompting users to either continue with Google or enter their email and password, enhances accessibility and streamlines the login process, leveraging Google's secure authentication system.
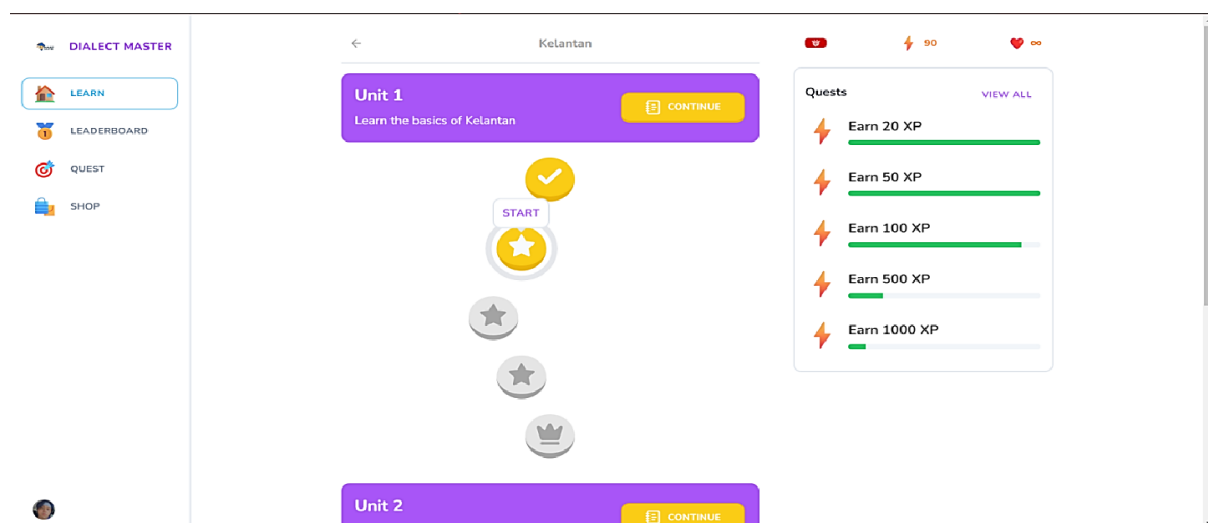
B Learn Page

Figure 4: Learn page.

The Learn page of the DialectMaster web application, shown in Figure 4, provides an interactive learning experience with a clear progression path through units and lessons, such as "Unit 1: Learn the basics of Kelantan". It features gamification elements like badges and XP (experience points) to motivate users. The design includes progress indicators and a "Start" button for each lesson.
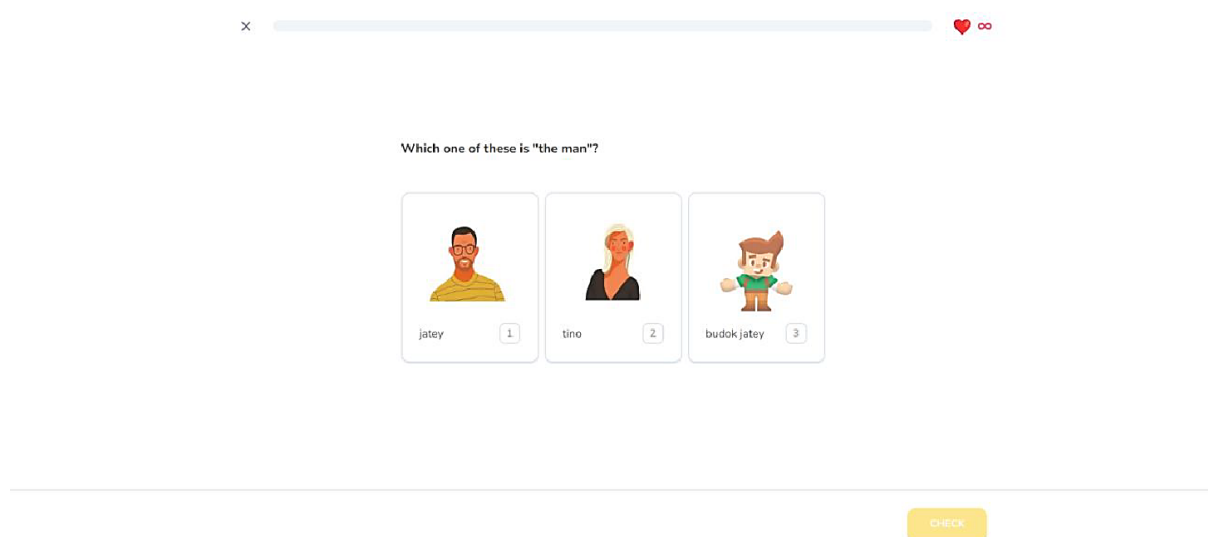

Figure 5: Quiz.

The Quiz page of the DialectMaster web application, shown in Figure 5, provides an engaging way for users to test their knowledge after starting a lesson. The interface presents a question along with multiple-choice answers, using images and texts for a more interactive experience. Users can select their answer and click the "Check" button to submit. The Quiz Select Answer page of the DialectMaster web application allows users to interactively select their answers to quiz questions. When a user selects an answer, the chosen option is highlighted, and the application generates a corresponding sound to enhance the interactive experience. The design is clean and straightforward, making it easy for users to focus on the content and assess their learning progress effectively.
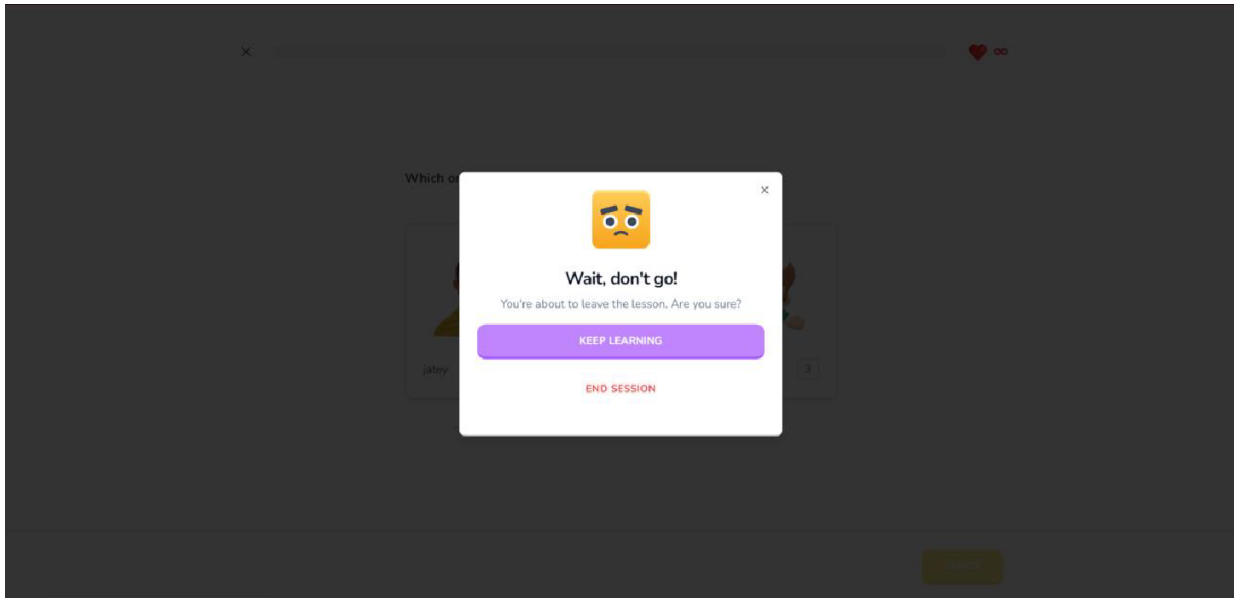

Figure 6: Quiz Terminate Session

The Quiz Terminate Session page, illustrated in Figure 6, appears when a user attempts to leave a lesson without completing it. This popup prompts the user with a friendly message, "Wait, don't go!" to encourage them to continue learning. The message provides options to either "KEEP LEARNING" or "END SESSION", allowing users to make an informed decision. This feature is crucial in maintaining user engagement and ensuring they receive the full benefit of the lesson.
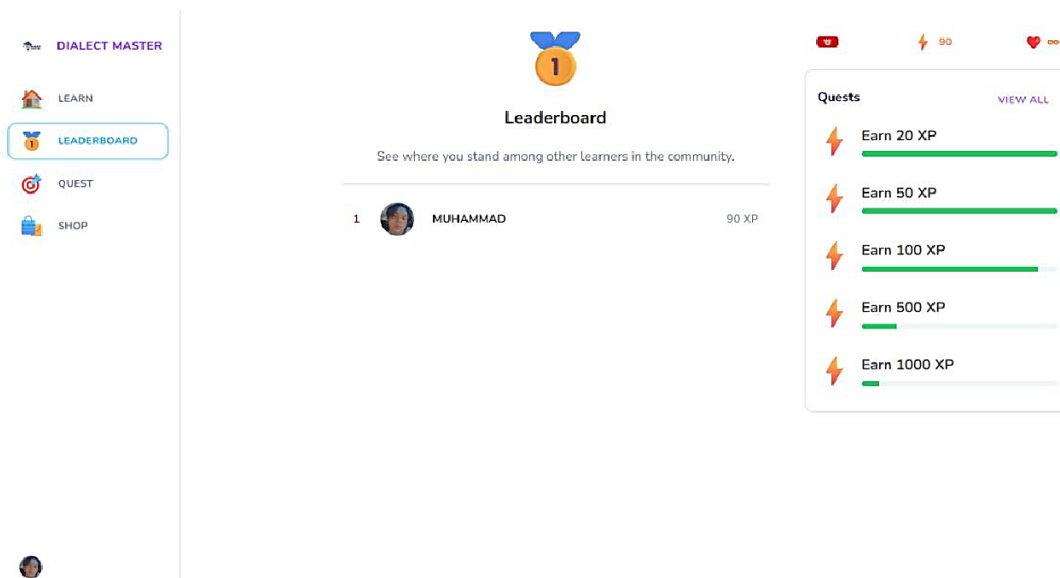

Figure 7: Leaderboard Page (PC and mobile)

The Leaderboard page, as shown in Figure 7, allows users to see where they stand among other learners in the community. It displays the top 10 learners based on the XP points they have earned. This

feature encourages a competitive spirit and motivates users to engage more with the lessons to climb the ranks.
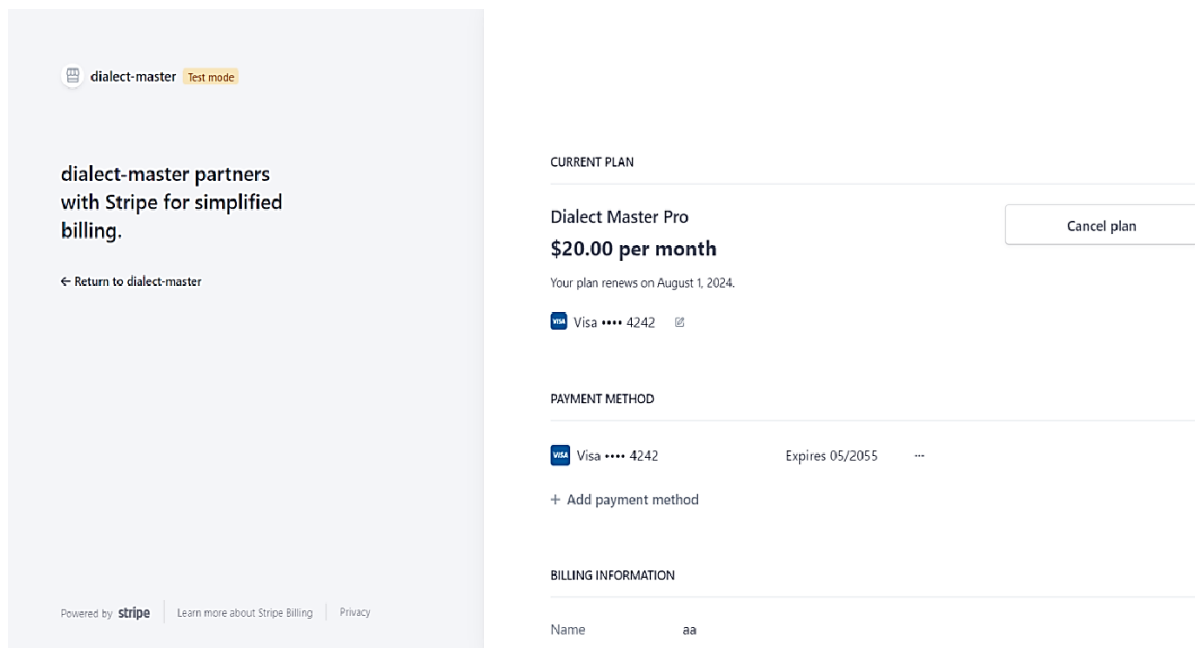

Figure 8: Stripe Subscription

The Stripe Subscription Page, illustrated in Figure 8, is displayed when users opt to subscribe to the Dialect Master Pro plan. This page, accessible on both personal computers (PCs) and mobile devices, provides a streamlined billing process powered by Stripe. Users can review their current plan, which costs RM20.00 per month, and manage their payment methods. The page allows for easy addition of new payment methods and displays essential billing information, ensuring a smooth and secure subscription process for users looking to enhance their learning experience with unlimited hearts and additional features.

5   Conclusion

The development of "DialectMaster: A Gamified Dialect Learning Web Application" marks a significant milestone in language education, particularly in regional dialect acquisition. This project has successfully integrated advanced web technologies and innovative gamification principles to create a robust and engaging platform for learning the Kelantanese dialect. The application addresses the unique pronunciation, vocabulary, and grammar of the Kelantanese dialect through an interactive and multimedia-rich curriculum, providing users with a comprehensive and immersive learning experience.

In conclusion, DialectMaster represents a pioneering approach to dialect learning, leveraging web technology and educational psychology to create an effective and engaging platform. The success of this project underscores the potential of gamified learning applications in language education. Future enhancements should focus on incorporating advanced AI capabilities to further personalise the learning experience and to expand the content to cover more regional dialects. The iterative and user-centred development process will continue to be key in ensuring that DialectMaster remains a cutting-edge tool in dialect education.

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Conflict of Interest Statement

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