Lexibot: A Customizable AI-Powered Gamified Platform for English Language Learners

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ABSTRACT

The rise of digital technology has transformed education, especially in language learning. LexiBot is a gamified AI-powered platform designed to support first-semester English learners by focusing on grammar, vocabulary, and writing. It complements classroom instruction with interactive lessons and quizzes to boost engagement and consistency. Users can access content in various formats—notes, summaries, and animated videos—then apply their knowledge through solo or peer-challenge quizzes. Features like "Explain My Answer" and "Improve My Sentence" offer instant AI feedback for better understanding and writing. To foster learner autonomy, LexiBot includes an AI coach that provides grammar hints, rule explanations, and sentence suggestions. Motivational tools such as XP points, badges, streak trackers, and digital titles like "Grammar Champion" keep learners engaged without the stress of peer judgment. The initial version includes one daily lesson theme, multiple content formats, a point-based quiz system, a local leaderboard, and AI tools for writing enhancement. Early development results show that combining AI and gamification promotes personalized learning, reduces anxiety, and increases motivation. As mobile and web-based education tools grow, LexiBot offers a learner-centered approach to acquiring English skills, showcasing how AI and game-based mechanics can enhance modern education effectively.

Keywords: Language learning, gamification, artificial intelligence, educational technology, English grammar, AI coach, LexiBot, digital learning tools.

INTRODUCTION

Digital technology has revolutionized language learning. Traditional classroom methods often fail to provide the level of engagement, personalization, and immediate feedback needed by today's learners (Johnson, 2019) First-semester English learners frequently struggle with sustaining motivation, managing language anxiety, and developing writing accuracy. Research suggests that gamification increases learner motivation and participation by integrating game mechanics such as points, badges, and leaderboards into the learning process (Deterding et al., 2011). Similarly, the use of artificial intelligence (AI) in language education has been shown to enhance writing and grammar development through instant feedback and adaptive learning pathways (Guan et al., 2024)

Building on these insights, LexiBot was developed as a customizable AI-powered gamified platform designed to address the challenges faced by English language learners. By combining interactive lessons, AI feedback tools, and motivational elements, LexiBot aims to provide a supportive yet stimulating environment that promotes language proficiency and nurtures 21st-century learning skills such as autonomy, critical thinking, and digital literacy.

Problem Statement

Language learners across different contexts often encounter common challenges such as limited opportunities for personalized learning and meaningful feedback that adapts to their pace and unique difficulties. According to Xiao, Zhang, and He (2024), traditional classroom assessments are often standardized for large groups of students, which indirectly disregard individual weaknesses, limiting personalized instructional support. These challenges are observed in the acquisition of other languages besides English, suggesting that engaging and context-based strategies have broad relevance and effectiveness across language education (Xiao et al., 2024).

It can be argued that students require more adaptive guidance to bridge the gap between passive learning and active language usage. English language learners in particular face evident challenges in grammar and writing skills acquisition despite years of formal instruction. Research shows that many learners rely heavily on rote

memorization as a result of no targeted feedback that helps them understand the reasoning behind errors or their responses. As Cheah et al. (2020) argue, elaborated feedback can raise student performance if provided in manageable units and linked explicitly to the student's goals and performance, fostering deeper comprehension rather than surface-level retention. Problems of insufficient feedback results in a superficial understanding without the ability to apply knowledge in different contexts. Furthermore, common assessments such as quizzes and tests evidently fall short in comparison to assessment tools like Quizizz and Kahoot. In the absence of interactive and unique practice methods, traditional grammar and writing lessons are often repetitive and unengaging, leading to low motivation and a lack of sustained practice.

Strong writing and grammar skills are essential for both academic and real-world communication. Writing skills enable learners to clearly convey their thoughts and ideas, which is crucial in both educational and professional contexts. Without effective strategies, learners risk plateauing in their development, unable to apply classroom knowledge in practical settings. Regular practice, feedback, and focused improvement on grammar, vocabulary, sentence structure, clarity, coherence, and precision are necessary to overcome these challenges and enhance communication skills (Andleeb et al., 2025).

What remains unclear is how to effectively combine personalized feedback with engaging practice methods that can sustain long-term learner engagement. While AI tools and gamified approaches have been studied separately, research suggests that their integration creates a "potent synergy" that enhances motivation and comprehension (Mohammed & Jesudas, 2025). For instance, adaptive AI-driven pathways can tailor lessons to individual performance, while gamified elements like rewards and challenges maintain engagement. However, challenges persist in balancing emotional and cognitive demands, as AI chatbots in language learning may struggle to consistently align feedback with learners' affective states (Xiao et al., 2024). An AI assistance bot that provides personalized explanations paired with gamified mini-games for grammar and writing presents a promising approach to addressing this dual need—if designed to mitigate emotional disengagement risks highlighted in recent studies (Xiao et al., 2024).

This research therefore aims to examine how the integration of AI-driven personalized support and gamified practice can enhance learner autonomy. Specifically, the study will explore the extent to which this approach enhances understanding of specific areas and foster sustained motivation. By exploring this intersection, the study can provide insights into how technology-enhanced approaches can transform English learning experiences in broader educational contexts.

Objectives

1. Students will be able to enhance their English proficiency by using Lexibot's gamified platform, effectively improve their accuracy and fluency.
2. Students will be able to use Lexibot's AI-powered platform through feedback and grammar hints in developing meaningful and well-constructed sentences.
3. Students' motivation and engagement will increase by applying game mechanics such as XP points, badges, streaks, and leaderboards, creating a fun yet effective learning experience.
4. Students will be able to foster 21st-century learning skills including autonomy, critical thinking, and digital literacy by encouraging learners to take charge of their progress in a supportive, stress-free environment.

PRODUCT DESCRIPTION & METHODOLOGY

Product Description

Lexibot is an AI-powered learning platform developed to support English language acquisition through structured interaction and gamified activities. Upon logging in with a student email, users are presented with a

simple and intuitive interface that organizes lessons, exercises, and progress tracking in one accessible environment. The platform is specifically designed for self-learners who require consistent feedback and motivation in the absence of a tutor, offering personalized guidance and instant corrective responses throughout the learning process. By integrating lesson navigation with real-time interaction, Lexibot ensures that students remain engaged and oriented as they progress through increasingly complex language tasks.

At the core of the platform are five mini-game modes, each serving a distinct instructional purpose. These modes provide targeted challenges in areas such as grammar application, sentence construction, and vocabulary reinforcement, with immediate AI feedback embedded into each activity.

Figure 1 Game Modes


Figure 2 AI Assistance Chat Page
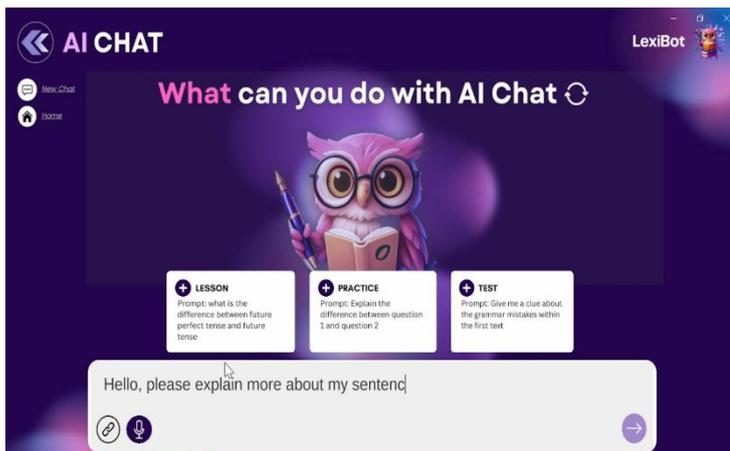
This real-time correction mechanism enables learners to identify errors and adjust their responses immediately, transforming abstract grammar rules into practical, usable knowledge. Complementing the game-based modules is a test level, which allows students to assess their overall progress and submit scores for tracking purposes. This feature establishes a feedback loop that enables learners to monitor their progress over time and revisit areas that require additional practice.

In addition to its structured exercises, Lexibot incorporates an AI-driven chat function that simulates real-time conversation and tutoring. Through this channel, learners can pose questions, receive explanations of grammar and tense usage, and refine their writing techniques with context-sensitive feedback. The system adapts to individual learner inputs, creating a dynamic exchange that mirrors the guidance typically provided by a human instructor. Lexibot's modular design also allows seamless updates and the integration of additional features, ensuring that the platform remains flexible and scalable across multiple environments, including web, mobile, and VR.

Figure 3 Gamified Lessons

Figure 4 Test and Practices
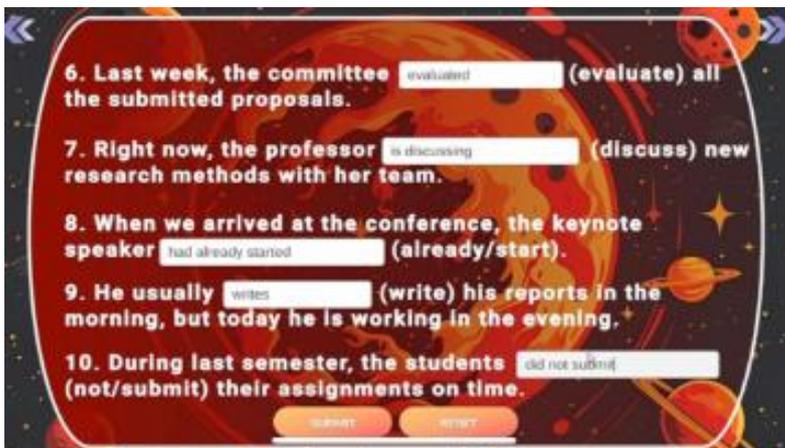
METHODOLOGY

This research employs a mixed-methods approach consisting of two distinct methodologies: developmental research and descriptive quantitative research. Developmental research guides the app creation of the LexiBot gamification lessons engine. In contrast, descriptive quantitative research is used to analyze participant responses during preliminary product testing. Data collection relies on a survey to assess participants' experiences with the gamified AI-assisted learning application, while thematic analysis of qualitative survey feedback is used to identify patterns, attitudes, and insights related to the product's effectiveness and user engagement

LexiBot was developed using the Unity 2D platform, which allowed the design of multiple scenes representing various lesson stages. Each scene incorporated visual and interactive elements such as text displays, score systems, and gamified challenges to maintain learner motivation. To integrate AI assistance, a ChatGPT API key was embedded within pre-designed Unity scenes containing an input field, enabling users to receive instant, AI-generated feedback on their responses. This combination of Unity's visual interactivity and ChatGPT's language processing capabilities formed the core of LexiBot's gamification lessons.

The testing process involved two main stages. First, internal testing was conducted among the developers to ensure that all features, including AI response accuracy and interface functionality, operated smoothly. Then, the prototype was distributed among peers and professionals. The user testing was carried out during class sessions for trial. Participants explored the gamified lessons, and experienced the AI-assisted components within the app. Following the trial phase, a survey was distributed to gather participants' input regarding app usability, perceived effectiveness, and areas for improvement.

The participants involved consisted of individuals aged 18 to 25, primarily students of the English for Professional Communication (LG240) course in UiTM Shah Alam. This group was chosen because the game is specifically designed for English-major students focusing on multiple components of grammar and writing. Their feedback provided relevant insights into the application's educational value and functionality. The quantitative data collected from the survey were analysed using descriptive statistics, while open-ended responses were subjected to thematic analysis to identify recurring opinions and suggestions. These findings are crucial to assess LexiBot's performance and guide future amendments to the app.

POTENTIAL FINDINGS AND COMMERCIALISATION

Potential Findings

The implementation of Lexibot is expected to have several significant outcomes in English language learning. Students will likely demonstrate higher engagement levels compared to traditional self-study methods due to the integration of gamified activities and immediate AI-driven feedback. Prior research supports this expectation, as gamification increases motivation and engagement by up to 48% in digital learning contexts (Hamari et al., 2014). The use of mini-game modes transforms repetitive practice into interactive challenges for learners.

Additionally, the inclusion of real-time AI chat support may lead to improved grammatical accuracy and sentence construction, as learners receive corrective feedback at the moment of error. Evidence suggests that students receiving instant feedback achieve 31% better learning outcomes compared to those with delayed responses (Shute, 2008). This finding aligned with Lexibot's real-time correction features. Progress tracking and score submission features are designed to highlight measurable improvements in writing proficiency, allowing both students and educators to monitor development across various language components. Collectively, these outcomes would underscore the effectiveness of combining gamification and artificial intelligence in fostering autonomy, retention, and critical thinking in language acquisition.
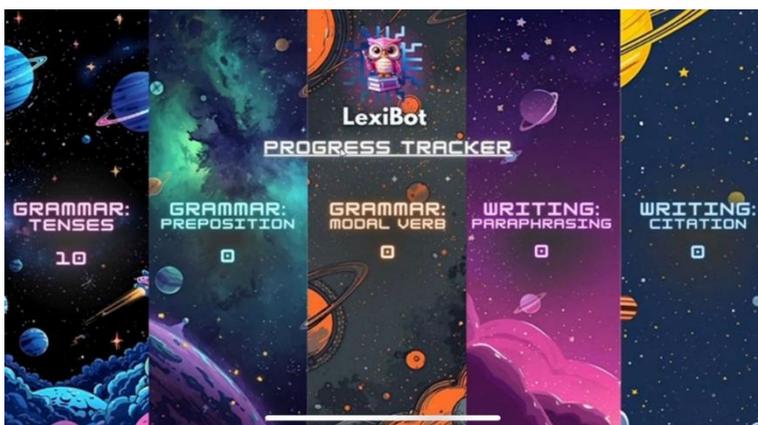
Figure 5 score Progress Tracker

Figure 6 LexiBot Quick Buttons

Quantitative Findings

Survey responses revealed overall positive feedback toward LexiBot's functionality and learning support. Participants evaluated the system's AI assistance as highly effective, with an average rating of 4.5 out of 5. A majority (60%) expressed satisfaction with the AI's writing corrections and feedback, emphasizing their relevance and usefulness in supporting learning progress. Regarding usage frequency, most respondents preferred engaging with LexiBot two to three times per week, while the remainder favoured shorter daily sessions. These results suggest a consistent level of interest and potential for sustained learner engagement.

Figure 7 Survey Bar Chart of LexiBot's Functionality Feedback
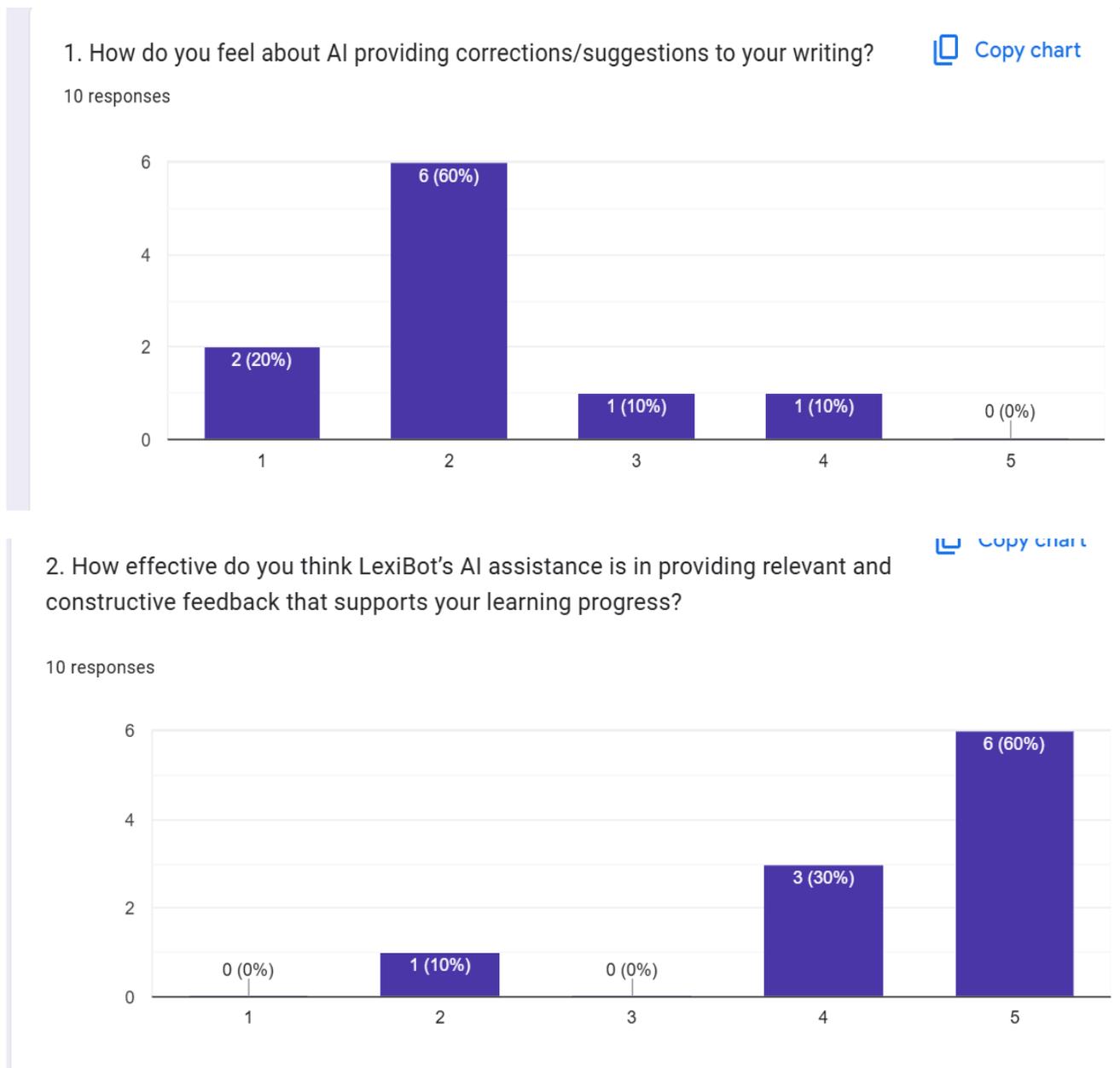
Learner Perceptions and Core Features

When asked which elements of LexiBot contributed most to their learning experience, the majority identified instant AI feedback and assistance as the most beneficial feature. Other valued components include peer-challenge quizzes and vocabulary-based activities. Learners highlighted that the swiftness of AI-generated feedback facilitated a clearer understanding of their errors. Descriptive responses further characterized LexiBot as motivating, interactive, and effective, underscoring LexiBot's potential to enhance students' confidence and self-directed practice.

Figure 8 Pie Chart of Preferred Features Feedback
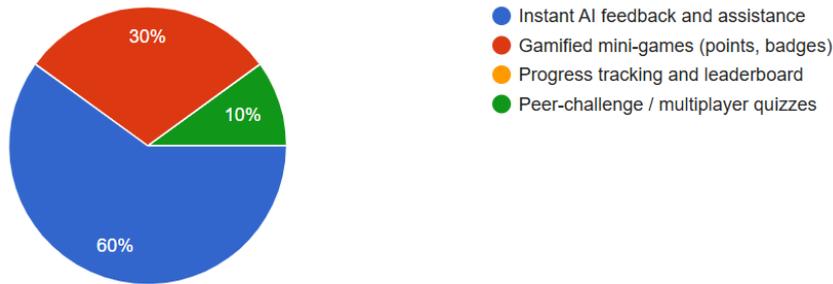
In addition, participants offered suggestions for future improvement. Common recommendations included the integration of a voice interaction feature, pronunciation support tools, and short formative quizzes to reinforce learning outcomes. These insights reflect learners' desire for a more comprehensive and multimodal language learning experience. The survey results reaffirm the effectiveness of LexiBot's AI-driven feedback while highlighting the importance of incorporating additional interactive features to optimise learner experience and linguistic development.

Figure 9 Table of User Suggestions Feedback

Commercialization

From a commercialization perspective, Lexibot presents multiple pathways for market adoption and revenue generation. Its effective design ensures adaptability across platforms, including web, mobile, and VR, making it suitable for a wide range of users and institutions. The target market's readiness further strengthens the product's commercial viability, with over 85% of students already utilizing AI tools for learning (Forbes, 2025). As an independent product, Lexibot could be marketed directly to individual learners through subscription-based access or freemium models, thereby maximizing accessibility while offering premium features such as advanced analytics or expanded game modes. In addition, partnerships with educational institutions and EdTech distributors would enable Lexibot to serve as a classroom supplement, allowing for bulk licensing and institutional integration.

Furthermore, the platform's potential is amplified by the rapidly expanding global English language learning market, valued at over US$45.1 billion in 2024 and projected to reach US$127.7 billion by 2035 (Hade &

Bhawal, 2025). Intellectual property protections, including trademarks, copyrights, and trade secrets, further safeguard its innovative approach, ensuring competitive differentiation in the edtech sector. With the global demand for accessible English learning tools continuing to rise, Lexibot holds strong potential for large-scale adoption, particularly in regions where access to tutors is limited but digital learning infrastructure is expanding.

LIMITATIONS

Despite the benefits of the integration of Artificial Intelligent on the learning experience, LexiBot may be difficult for some students to utilize due to economic and financial constraints. This applies to students who have low-capacity devices to run an advanced gamified educational tool, especially ones with AI-integration. AI software requires constant updates; hence, it will be difficult for students to keep updating their devices and free some device storage for the application. Students who are from lower income families rely on outdated hardware so, they may not be able to run the application smoothly. Devices that have a low RAM will cause issues like lagging, unsaved progress, and game crashes, which affect their learning experience.

Furthermore, LexiBot requires a good internet connection for a smooth sailing experience. The integration of Artificial Intelligence in the tool requires excellent connection for real-time conversation. A weak or disrupted connection can delay LexiBot's direct responses. Students might face severe lag due to the poor connections and will lose their game progress. As such, results, achievements, and feedback cannot be saved in the cloud processing or the game data, which will be terminated or lost in the future.

Other minor issues to improve in the gamification lessons include the learning contents in LexiBot are fixed. This might not match some institutional current curricula. LexiBot prioritises usage for revision or extra learning tools in class, but not as examination-oriented or one of the core tools in the syllabus. Educators cannot fully depend on LexiBot as their teaching core tool because the learning materials in LexiBot are more rigid and fixed in nature. Additionally, the game's scoring, progress tracking, and data analytics may not follow the standardized assessment criteria, which means the data collected cannot be translated into the institution's official grading of the assessment.

NOVELTY AND RECOMMENDATIONS

LexiBot introduces a unique innovation by combining artificial intelligence and gamification in a single, customizable platform for English Language Learning. Previous gamified tools have been shown to increase learner motivation and participation through mechanics such as points, badges, and leaderboards but they often lack sufficient linguistic depth to improve grammar and writing skills (Hamari et. al, 2014). AI-powered systems such as Automated Writing Evaluation (AWE) provide corrective feedback and scoring on written texts but do not adequately address the issue of learner engagement and persistence (Wang et al., 2024). LexiBot integrates both approaches, offering motivation through gamification and personalized feedback through AI. This dual design fills an important gap in current digital learning solutions by simultaneously fostering engagement, accuracy, and learner autonomy in a supportive environment.

For future development, LexiBot could be expanded to include speaking and listening modules, enhanced natural language processing for real-time interaction, and full cross-platform accessibility to reach a wider range of learners. Educators are encouraged to adopt the platform as a supplementary tool to reinforce classroom instruction, while researchers may investigate its long-term effects on motivation and language proficiency. Beyond university learners, LexiBot holds potential for use in schools, language centres, and independent learning contexts, supporting the acquisition of both English proficiency and essential 21st-century skills. In conclusion, LExiBot demonstrates the promise of integrating AI and gamification in language education and offers significant opportunities for future research and innovation.

RECOMMENDATIONS

The following recommendations are suggested to enhance the overall user experience of Lexibot and its effectiveness on language learning. Firstly, developers need to consider the features implemented in Lexibot. This is mainly because Lexibot uses AI to provide personalised learning guidance, and it works best with a stable

internet connection. It is advisable for developers to investigate a way for Lexibot to operate offline in areas where the internet becomes inaccessible. That way, Lexibot can operate even without internet connectivity and that will allow learners to use Lexibot at all times.

Secondly, developers could also investigate the long-term effects of using Lexibot for a long time on learners' language development. This suggestion may include monitoring learners' learning session, collecting feedback and assessing language retention over time. Developers could also track learners' learning data and analyse the quiz scores or completion rates to examine patterns of improvement or decline. By doing this, developers are aware of how Lexibot influences learners in the long run, ensuring that it is effective as a language learning tool.

Finally, it is essential for developers to understand how Lexibot helps in enhancing speaking and listening skills. This can be assessed by incorporating methods such as speech recognition tools to evaluate learners' pronunciation, accuracy and fluency. Meanwhile, integrate comprehension tests to assess learners' listening skills. It could measure the level of understanding and the learners' ability to apply the spoken input into various situations. Ultimately, Lexibot could help in transforming learners to become more confident of their skills and verbal communication after using the platform in a span of few months.

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