



UNIVERSITI
TEKNOLOGI
MARA

Kampus Cengalau, Kuala

i-SPIKE2025
INTERNATIONAL SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

E-PROCEEDING

EXTENDED ABSTRACT

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اوسها تقوى موليا

E-PROCEEDING

EXTENDED ABSTRACT



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e ISBN 978-967-2948-91-9



UiTM Cawangan Kedah

Published by:
Universiti Teknologi MARA (UiTM) Cawangan Kedah
Sungai Petani Campus
08400 Merbok
Kedah
Malaysia

Welcome Message

RECTOR, UITM KEDAH BRANCH

Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to extend my deepest appreciation to the organising committee of i-SPIKE 2025 for their steadfast dedication and commitment in making this prestigious event a reality. My heartfelt congratulations to the committee for their tireless efforts in ensuring that i-SPIKE continues to grow as a meaningful and impactful platform for academics, researchers, students, and industry players worldwide.

The theme for this year, “Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future,” is both timely and significant. It reflects our shared responsibility to not only embrace creativity and technological advancement, but also to ensure that innovation directly contributes to sustainable development, equitable education, and the well-being of future generations.

i-SPIKE 2025 provides a dynamic platform for showcasing innovations that address real-world challenges while opening new avenues for collaboration, engagement, and inclusivity. By bridging knowledge, innovation, and education, this symposium strengthens our collective capacity to design solutions that empower communities and inspire positive change.

I am truly impressed by the diversity and calibre of participants in this year’s event. The projects and ideas presented highlight the extraordinary creativity and determination of our innovators. I am confident that the insights and solutions shared here will pave the way for continuous advancement in teaching, learning, and innovation.

It is my sincere hope that you will find i-SPIKE 2025 an enriching experience, one that sparks new ideas, builds lasting collaborations, and strengthens our shared vision for a sustainable future. To all participants, I wish you every success, and to the winners, my warmest congratulations.

Once again, I thank the organising committee, partners, and contributors for their invaluable support. May i-SPIKE 2025 continue to inspire and empower minds for many years to come.

Professor Dr. Roshima Haji Said
Acting Rector
Universiti Teknologi MARA (UiTM) Kedah Branch

Welcome Message (i-SPIKE 2025 CHAIR)

It is my great pleasure to welcome you to the 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2025 (i-SPIKE 2025). This year's theme, "Empowering Minds: Bridging Innovation, Knowledge, and Education for a Sustainable Future," reflects our collective commitment to advancing innovation and fostering meaningful collaboration across academia, industry, and communities.

i-SPIKE 2025 provides a platform for scholars, researchers, students, and practitioners from diverse fields to showcase their ideas, share knowledge, and inspire new solutions to global challenges. We extend our sincere appreciation to all participants and contributors whose efforts and dedication have made this symposium possible.

We hope that this e-proceedings serves not only as a record of the innovations presented but also as a valuable resource that continues to inspire long after the event.

Thank you.

Dr Junaida Ismail
Chair

4th International Exhibition & Symposium on Productivity, Innovation,
Knowledge, and Education 2025 (i-SPIKE 2025)

PREFACE

The 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education (i-SPIKE 2025) marks yet another milestone in our ongoing commitment to fostering innovation, creativity, and collaboration across disciplines. Guided by this year's theme, "Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future," the event provides a dynamic platform for students, educators, researchers, and professionals to share their ideas, showcase their innovations, and engage in meaningful knowledge exchange.

This year, we are pleased to report that i-SPIKE 2025 received approximately 50 initial submissions, with more than 35 projects successfully advancing to final presentation and exhibition. These projects reflect a rich diversity of innovation, ranging from educational technologies, digital applications, and gamified learning tools to sustainable materials, cultural heritage preservation, and community-focused solutions. Collectively, they embody the spirit of bridging innovation and education to address pressing societal and global challenges.

We sincerely thank all participants, reviewers, and committee members for their invaluable contributions in making i-SPIKE 2025 a success. It is our hope that this e-proceedings will not only serve as a record of the ideas and innovations presented, but also as an inspiration for future collaborations and advancements in the pursuit of sustainable knowledge and innovation.

Assoc. Prof. Dr. Azlyn Ahmad Zawawi
Editor-in-Chief, i-SPIKE 2025 Proceedings

TABLE OF CONTENTS

No	Title	Page No.
CATEGORY 1 – S&T (ACADEMIC)		
1.	THE CC GUY RETURNS: VISUALISING CONTINUITY CORRECTION USING CHARACTER NARRATIVES AND BAR LOGIC	2
2.	ENHANCING CONCEPTUAL UNDERSTANDING IN DIFFERENTIAL CALCULUS THROUGH EASYDIFF	8
3.	THERMAL ANTINOCICEPTIVE EFFECT OF TRANSDERMAL TRAMADOL HYDROCHLORIDE IN AVIAN	13
4.	OPENAIPEROVSKITE: A SMART DASHBOARD FOR SOLAR PERFORMANCE TRENDS OF 2D LEAD-HALIDE PEROVSKITES	18
5.	RENEWED3D: MODUL REALITI MAYA BUKAN IMERSIF UNTUK PENDIDIKAN TENAGA BOLEH BAHARU	25
6.	ROACHAWAY: A NATURAL COCKROACH REPELLENT AND INSECTICIDE FROM SEKENTUT LEAVES (<i>PAEDERIA FOETIDA</i>) EXTRACTS	31
7.	VIRTUAL REALITY IN INDUSTRIAL TRAINING: SUSTAINABLE CAMPUS-BASED LEARNING INNOVATION	36
8.	MA-TICK 2.0: A TRULY GREEN TICKICIDE	41
CATEGORY 1 - S&T (YOUNG)		
1.	AUTOMATED ROBOT MOVEMENT FOR SORTING (ARMS)	48
2.	SPEAKEASY NIHONGO: MOBILE APPLICATION FOR JAPANESE BEGINNER LEARNERS	53
3.	AURA: STREAMLIT-BASED DECISION SUPPORT SOFTWARE FOR SUSTAINABLE MULTI-CRITERIA DECISION-MAKING	59
4.	ELECTROCOAGULATION CLEANUP WITH RECYCLED CANS	64
CATEGORY 2 – SS (ACADEMIC)		
1.	ReProDB 2.0: A DIGITAL GATEWAY TO SMARTER RESEARCH DATA MANAGEMENT	70
2.	BIZMATH-FAST (BUSINESS MATHEMATICS – FORMULA ACCURACY & SPEED TRAINER)	84
3.	COLLABORATIVE INNOVATION LAB: RATE & REFLECT SIMULATION	89

CATEGORY 1
S&T (YOUNG)

SPEAKEASY NIHONGO: MOBILE APPLICATION FOR JAPANESE BEGINNER LEARNERS

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ABSTRACT

Learning a new language can open doors to exciting opportunities, but it also presents several challenges. For most learners, acquiring fluency involves more than just memorizing vocabulary or understanding grammar rules. Effective communication requires mastering not only the words but also the sounds and rhythms of the language. However, many learners face difficulties when trying to develop their language skills, especially in areas that go beyond reading and writing. This project focuses on the development of a Japanese language learning app called *SpeakEasy Nihongo: Mobile Application for Japanese Beginner Learners*. The main aim of the app is to help beginner learners improve their Japanese pronunciation through interactive quizzes and lessons. Unlike typical language apps, this app puts a strong focus on pronunciation feedback and engagement by combining AI, speech recognition, and gamification features. The app allows users to practice Hiragana, Katakana, numbers, and other basic vocabulary. Each lesson comes with audio, allowing users to hear the correct pronunciation before recording their own. The app uses Microsoft Azure's Speech API to score users' pronunciation and provide instant feedback, making it easier for learners to identify and correct mistakes. One of the main advantages of this app is that it gives learners the chance to self-practice pronunciation with feedback, which is often lacking in beginner-level apps. The gamified quizzes and audio-based tasks also help increase motivation and keep the learning experience fun. This research followed a development-based methodology which involved requirement analysis, interface design, system development using Flutter and user testing. A User Experience Questionnaire (UEQ) was used to evaluate the interface and app features. The results showed positive feedback across all six UEQ scales, especially in areas like Perspicuity and Stimulation. Based on these findings, future improvements could include adding more lessons, expanding chatbot functions, and enhancing voice input accuracy for more natural learning.

Keywords: Japanese language learning, mobile application, pronunciation practice, gamification, speech recognition

INTRODUCTION

Pronunciation practice is essential for confident communication in Japanese. However, many language learning methods prioritize vocabulary and reading, and often neglecting listening and speaking skills, which are harder to master (Rethinasamy et al., 2021). This imbalance can make it harder for learners to develop speaking and comprehension skills, both crucial for real-life communication. A language learning platform should engage learners by using interactive and dynamic methods that make learning both enjoyable and effective. By adopting this approach, the platform can offer a balanced learning experience that builds speaking and listening skills while boosting learners' confidence. It can also support educators in creating engaging lessons that cater to diverse learning styles (Hoxhaj, S., 2024). This project propose s a mobile application that can enable user to see where student make mistake in pronunciation (Chaib et al., 2023). A mobile app with speech recognition technology can help provide focused support that traditional methods often lack, giving learners real-time, useful feedback on their pronunciation (Brata, 2020). Such an app empowers learners to practice independently, refine their speaking skills, and build confidence in their ability to communicate accurately in Japanese. A language learning platform should keep learners engaged and motivated by using dynamic and interactive methods that make the process both enjoyable and productive, in which can be enhanced by including gamification feature that has been shown to enhance motivation and performance, making learning more enjoyable while tailoring challenges to different skill levels (Brata, 2020). By incorporating such methods, the platform can provide a more well-rounded learning experience that not only builds speaking and listening skills but also fosters greater confidence in using the language. This approach can transform the teaching and learning experience, supporting educators in designing engaging and imaginative lessons that cater to a variety of learning styles (Hoxhaj, S., 2024).

METHODOLOGY

2.1 Materials for Application

The materials for the application are designed to enhance pronunciation practice and engagement for beginner learners. The materials for the app include audio files that consists of:

- a. **Characters:** 46 Hiragana and 46 Katakana characters, each with an audio file for accurate pronunciation.
- b. **Words/Phrases:** Approximately 1000-1500 common words and phrases for beginners, with audio files to help learners listen to the correct pronunciation before attempting to speak.

The primary purpose of these materials is to allow learners to listen first, ensuring they hear the correct pronunciation of each character, word, and phrase. By listening to the audio, learners can become familiar with the sounds before practicing their pronunciation. This approach supports better retention and comprehension, as learners can more effectively match sounds to their corresponding characters and meanings.

2.2 System Architecture

The app uses layered architecture, which includes Presentation Layer, Business Layer, and Data Layer. Each of these layers has their own job that makes sure everything works properly, ensure smooth interaction, fast processing, and secure data handling in the app. The Presentation Layer is what user see and use. It has quiz questions, pronunciation result, and gamification elements such as badge and progress bar. This layer also handles the voice input where user speak into the microphone and the app will record the sound to check and give feedback later. The Business Layer handles the main functions of the app and includes three key modules. The Learning Module accesses learning audio materials stored in Google Cloud and plays them for users. The Pronunciation Module captures voice input through the device microphone and sends it to the Azure Speech Service API, which processes the audio and provides pronunciation feedback. The Gamification Module manages features like daily quizzes, tracking streaks, setting reminders, sending push notifications, and awarding badges to keep users motivated and consistent. The Data Layer manages all user data. Simple data such as quiz scores and gamification status are stored locally using SharedPreferences. Meanwhile, Service Tools are responsible for syncing data with cloud services such as Google Cloud and Azure, ensuring that audio files and pronunciation feedback are always updated and reliable.

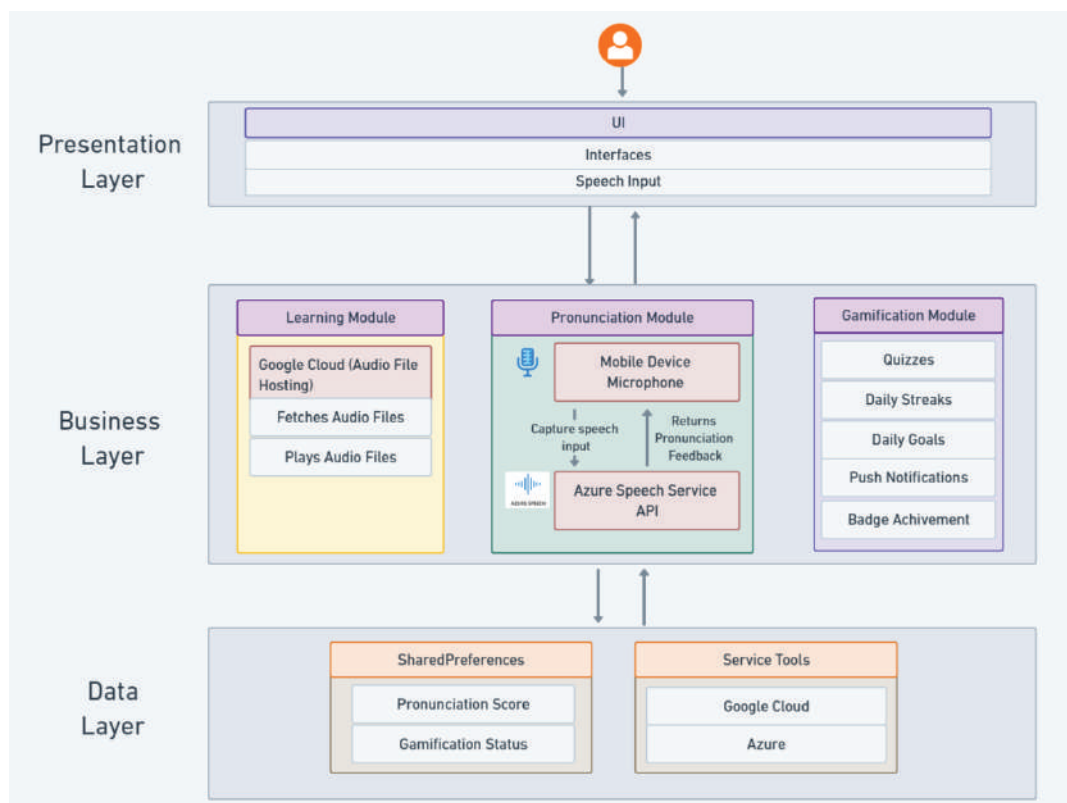


Figure 1. System Architecture

RESULTS AND DISCUSSION

This section presents the results of the User Experience Questionnaire (UEQ) completed by 42 participants from various Japanese learning groups. The participants included high school students from SMK Putrajaya Presint 11(1), college students enrolled in Japanese language courses, and adults attending Japanese classes. By including participants from diverse backgrounds, the data provides a broad perspective on how users from different demographics felt about the project.

According to standard UEQ guidelines, a mean value above +1.00 is considered a positive evaluation, between -1.00 and +1.00 is neutral, and below -1.00 indicates a negative impression. Higher values within the positive range (closer to +3) show stronger user satisfaction, while lower values (closer to 0 or negative) suggest weaker or problematic areas.

The six UEQ scales and their mean (M) scores for this app are as Table 1 below:

Table 1. UEQ Scales with Mean Score and Explanation

UEQ Scales	Mean	Explanation
Attractiveness	2.214	Users generally described the app as likable and appealing, indicating a strong overall impression and positive emotional response.
Perspiciuity	2.327	This is the highest-rated scale, showing that users found the app very easy to understand and quick to learn, especially helpful for beginners.
Efficiency	2.054	The results suggest that users were able to complete their tasks smoothly without wasting time or energy.
Dependability	1.060	Although still positive, this scale received the lowest score. Some users may have felt less confident in the app's consistency or reliability. However, this could be due to the app's context, where things like security and critical error handling are not top priorities.
Stimulation	2.125	Users found the app fun and engaging, which helps create motivation to continue learning.
Novelty	2.012	The app was seen as creative and fresh, with users appreciating its unique features and design compared to more traditional learning platforms.

Additionally, Figure 2 below provides a visual summary in the form of a bar graph. This chart uses a color scale ranging from red (-3) to green (+3) to show how each scale is rated by users. All six scales extend into the green area ($> +1$), indicating that the app is viewed positively in all dimensions. However, Dependability just barely crosses the green threshold, suggesting lower satisfaction in that area, and this is mainly due to reduced concern about security, which may not be essential for this type of app.

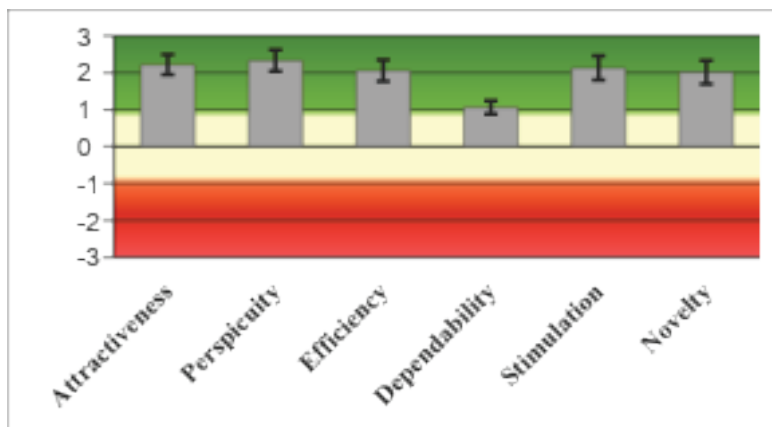


Figure 2. UEQ Scale Graph

CONCLUSION

To sum it up, SpeakEasy Nihongo has managed to bring a new and more helpful way for beginners to learn Japanese. With the feature of instant pronunciation feedback and the use of fun gamified approach, it makes learning feel less boring and more enjoyable. Instead of just memorizing, users can practice speaking and slowly build more confidence as they see their progress through the app. Overall, this project not only helps in mobile language learning, but also supports bigger goals like quality education and better learning access. With more improvement over time, SpeakEasy Nihongo has the chance to become a go-to app for Japanese learners everywhere.



ACKNOWLEDGEMENTS

Gratitude is extended to Universiti Teknologi MARA Cawangan Terengganu, Kampus Kuala Terengganu for the support provided, and to the Japanese language teachers from Sekolah Menengah Kebangsaan Putrajaya Presint 11 (1) for their valuable guidance, encouragement, and contribution towards the learning of the Japanese language.

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