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RESEARCH ARTICLE

Design and Development of a Simple Korean Letters and Vocabulary Learning Application for the "INDOMY" Group Based on Android Using the Rapid Application Development (RAD) Method

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Abstract
Korean language serves as the primary means of communication among the people of Korea. Learning Korean can be pursued through formal courses; however, such methods often face challenges, including limited meeting schedules and the necessity for face-to-face interaction. An alternative approach to studying Korean is through mobile learning platforms. The present study focuses on designing an Android-based application for learning Korean. The development methodology adopted is Rapid Application Development (RAD), which comprises three phases: Requirements Planning, Design Workshop, and Implementation. Data for the study were collected through questionnaires distributed to members of the "INDOMY" group. The outcome of the research is an educational application aimed at facilitating the pronunciation of Korean vocabulary by utilizing text derived from Korean song lyrics.

Keywords
Korean Language; Learning; Android.

1 | INTRODUCTION

Language represents a fundamental mechanism of human interaction, originating from the vocal apparatus that enables individuals to produce sounds imbued with meaning. Across the globe, each nation and region employs distinct linguistic systems for daily communication, reflecting cultural identities and social structures. Among these, the Korean language has gained significant prominence in Indonesia, driven by the widespread popularity of the Korean Wave, a cultural phenomenon encompassing aesthetics, fashion, and K-pop music. The allure of Korean culture, particularly through K-pop and television dramas, captivates a diverse audience in Indonesia, spanning both adolescents and adults. The surge in interest has spurred a growing number of young individuals and enthusiasts to pursue proficiency in Korean, seeking to engage more deeply with the cultural elements they admire. Various methods exist for acquiring Korean language skills, ranging from traditional textbooks and formal courses to self-study resources such as dictionaries. Despite the availability of these approaches, learners frequently encounter substantial hurdles. Challenges include difficulties in comprehending and articulating vocabulary, compounded by educational materials that often lack interactive elements, leading to disengagement and a diminished learning experience. The rapid pace of conventional learning modules can further exacerbate feelings of frustration among students, hindering sustained progress. At the core of language acquisition lies the mastery of written symbols, which represent syllables and phonemes essential for spoken expression. Korean letters, collectively known as Hangeul, constitute a unique script among the myriad writing systems worldwide, characterized by thousands of characters and distinct pronunciations. Gaining familiarity with Hangeul is paramount for achieving fluency in Korean, as it forms the foundation for reading, writing, and verbal communication. However, understanding these characters demands meticulous attention to detail to ensure accurate pronunciation that aligns with their intended meanings, especially given the phonetic similarities among numerous Hangeul symbols.

Advancements in educational technology have introduced diverse platforms to support language learning, including desktop applications, web-based tools, and mobile solutions. Each platform offers distinct advantages tailored to different learner needs. Mobile devices, notable for their compact design compared to desktop systems, provide unparalleled portability, enabling users to study at their convenience regardless of location. To enhance learner engagement and facilitate effective education, adopting methods that are both entertaining and interactive becomes essential. Consequently, there arises a pressing need for applications that blend enjoyment with functionality, offering intuitive interfaces and systems to support the study of Korean letters and vocabulary. A well-designed application can ignite enthusiasm, transform the learning process into an enjoyable endeavor, and enable users to grasp linguistic concepts swiftly. Leveraging textual content as an educational medium, the proposed application aims to simplify the practice of Korean vocabulary pronunciation. Beyond mere text, the application incorporates romanization of Hangeul characters alongside definitions of terms found within song lyrics, a popular cultural artifact among Korean enthusiasts. By presenting material in a textual format, the application fosters an interactive setting for honing spoken Korean skills. Users are afforded the opportunity to refine their oral proficiency and evaluate the precision of their responses, thereby reinforcing their learning outcomes through active participation.

The development of such an application builds upon a foundation of prior scholarly endeavors in the field of language education technology. Research by Yogo Prabowo, Supraptono, and Safi'i (2016) explored the effectiveness of Android-based applications utilizing Gesture API to recognize Korean characters, employing a One Shot Case Study design integrated with Research and Development (R&D) methodologies to stimulate student interest in Hangeul. Similarly, Somya and Tjahjono (2016) investigated the creation of basic Korean language learning media using the AndEngine library on Android platforms, incorporating accelerometer extensions to teach Korean letters through engaging mini-games. Their work underscores the potential of gamification in educational tools (Somya & Tjahjono, 2016). Further, a study by Endy Budianto and Iksan (2016) examined the application of object-oriented methods for Arabic language learning media using Google Speech on Android, demonstrating how speech-to-text technology can ease student comprehension of foreign languages. Additional studies provide broader perspectives on technology integration in education. Firstantin (2019) analyzed the fluency of Korean language learners in reading Korean texts, highlighting the importance of textual engagement in language mastery. Setiawan, Pranoto, and Santi (2020) focused on designing simple Korean language learning applications using Android Studio, emphasizing user-friendly mobile solutions for language education. Sirumapea, Panchadria, and Rosmiati (2020) also contributed to the discourse by designing mobile learning applications specifically for Hangeul, reinforcing the value of targeted tools in script acquisition. Rohman-UBSI and Mandiri (2020) proposed interactive Korean learning applications for beginners based on game elements, further advocating for engaging digital platforms.

Beyond language-specific research, several studies offer insights into the technical frameworks and methodologies underpinning educational application development. Gunarto, Abdullah, and Irawan (2018) explored mathematical modeling using Java programming, illustrating the versatility of programming languages in technical applications. Mohamad Firdaus (2022) designed chat-room applications with threading principles in Java, showcasing innovative approaches to real-time interaction in software design. Mubarak (2019) developed school web applications

using UML and object-oriented PHP programming, providing a structural blueprint applicable to educational tools. Mandasari and Kaban (2022) designed web-based library information systems using the Rapid Application Development (RAD) method and CSS Bootstrap framework, demonstrating the efficacy of RAD in expediting development processes. Lastly, Rosaly and Prasetyo (2019) elaborated on flowchart concepts and their common symbols, offering a foundational understanding of procedural design critical to application development.

Drawing from these scholarly foundations, the current project undertakes the development of an Android application titled "Design and Development of a Simple Korean Letters and Vocabulary Learning Application for the 'INDOMY' Group Based on Android Using the Rapid Application Development (RAD) Method." The application employs a text-based learning approach, enabling users to study Korean pronunciation at their leisure without requiring direct interaction with an instructor. The scope of the application is carefully delineated to ensure focused functionality. It incorporates readable texts to aid accurate pronunciation, operates exclusively on Android devices, and centers on vocabulary derived from song lyrics with Google as a reference source. Designed to function offline, it eliminates the need for an internet connection during use. Notably, the application excludes audio components and does not address grammar instruction, maintaining a targeted approach to vocabulary and pronunciation. The research questions guiding the project are twofold: whether designing an Android-based Korean learning application can support enthusiasts in their language studies, and whether the application facilitates accurate pronunciation of Korean letters and vocabulary from song lyrics. The objectives align with these inquiries, aiming to create a tool for learning Korean letters and vocabulary that enhances pronunciation understanding as an accessible method for language acquisition, and to provide a mobile learning platform accessible at any time and place. By addressing these goals, the application seeks to bridge existing gaps in Korean language education, offering a practical solution tailored to the needs of the "INDOMY" group, a community of Korean culture enthusiasts. The significance of mobile learning in modern education cannot be overstated, particularly in the realm of language acquisition where consistent practice and exposure are vital. The portability of mobile devices allows learners to integrate study into their daily routines, whether during commutes or brief intervals of free time. Furthermore, the cultural resonance of Korean song lyrics as a learning medium taps into the intrinsic motivation of enthusiasts, leveraging their passion for K-pop and dramas to sustain engagement. By focusing on textual content and romanization, the application circumvents barriers posed by auditory learning dependencies, ensuring accessibility for users in varied environments where audio playback may be impractical. The adoption of the RAD methodology in development ensures rapid iteration and responsiveness to user feedback, aligning the final product closely with learner needs. In summary, the growing fascination with Korean culture in Indonesia presents a unique opportunity to develop targeted educational tools that cater to enthusiastic learners. By harnessing mobile technology and drawing on established research in language learning applications, the proposed project aims to deliver a functional and engaging platform for mastering Korean vocabulary and Hangeul. Through a structured approach to design and development, underpinned by a robust body of academic literature, the application aspires to make a meaningful impact on the learning journey of Korean language enthusiasts within the "INDOMY" community.

2 | BACKGROUND THEORY

The rapid evolution of technology has significantly transformed the landscape of education, particularly in the realm of language learning. As mobile devices and software applications become increasingly integral to daily life, their potential as educational tools has garnered substantial attention. This background theory explores the intersection of programming methodologies, software development frameworks, and their application in creating educational tools, with a specific focus on language learning applications for Korean. Drawing on a comprehensive body of literature, this section elucidates the theoretical underpinnings of programming algorithms, software engineering practices, and the Rapid Application Development (RAD) methodology, which collectively inform the design and implementation of Android-based learning platforms. At the core of modern software development lies a deep understanding of programming algorithms, which serve as the foundation for creating efficient and functional applications. Purbasari *et al*. (2024) provide a detailed examination of programming algorithms, emphasizing their role in structuring logical processes that underpin software functionality. Their work highlights the importance of algorithmic thinking in solving complex problems, a critical aspect when developing educational applications that require seamless user interactions and responsive interfaces. Complementing this, Wali *et al*. (2023) offer an introductory guide to 15 of the most promising programming languages for future applications, providing insights into coding practices suitable for beginners. Their reference material underscores the versatility of languages such as Java and Python, which are frequently employed in Android development, thereby offering a robust starting point for crafting mobile learning tools.

Beyond algorithmic foundations, the broader context of software engineering and research operations provides essential frameworks for application design. Alfaris *et al*. (2022) explore operational research methodologies, which are instrumental in optimizing system designs and ensuring that applications meet user needs

efficiently. Their insights into systematic problem-solving are particularly relevant when tailoring educational tools to specific demographics, such as language learners. Additionally, Wali (2020) presents a practical module on software engineering, detailing the processes involved in designing and testing software. This resource is invaluable for understanding the lifecycle of application development, from conceptualization to deployment, ensuring that educational applications are both functional and user-friendly. The application of programming and software engineering principles to real-world scenarios further enriches the theoretical framework. Pebrianto and Hadi (2023) discuss the design of a web-based administrative system, demonstrating how technology can streamline complex processes. Their work on efficient system design offers parallels to the development of educational applications, where administrative features such as user progress tracking are crucial. Similarly, Sunardi and Henryanto (2022) focus on the creation of a translation application from Indonesian to the Nyow dialect, highlighting the potential of Android-based platforms in facilitating linguistic education. Their emphasis on localized language learning resonates with the goal of creating accessible Korean language tools for specific communities. Shiddiqramzy and Sediyono (2023) further contribute by exploring real-time chat applications as storytelling media on Android, illustrating how interactive features can enhance user engagement—a critical consideration for educational apps aiming to maintain learner interest.

Central to the development methodology of the proposed Korean language learning application is the Rapid Application Development (RAD) approach, which prioritizes speed and adaptability in software creation. RAD is characterized by iterative prototyping and close collaboration with end-users, ensuring that the final product aligns closely with user requirements. Hamdani, Mukhtar, and Ihsanuddin (2022) evaluate the application of RAD in designing a tender document information system, underscoring its efficacy in accelerating development cycles while maintaining quality. Their findings are particularly relevant for educational app development, where timely iterations can address learner feedback promptly. Similarly, Atmaja, Faizah, and Kambry (2023) apply RAD to develop an e-commerce application using the CodeIgniter 4 framework, demonstrating how this methodology supports rapid deployment of functional software solutions. Their work highlights the adaptability of RAD in handling diverse application types, including educational tools.

The versatility of RAD is further evidenced in language and educational application contexts. Zalukhu, Karo, and Faizah (2023) utilize RAD to design an Android-based dictionary application for the Nias regional language, showcasing how this approach facilitates the creation of niche language learning tools. Their success in leveraging RAD with Android Studio offers a direct blueprint for developing Korean language applications tailored to specific user groups. Poso, Faizah, and Karo (2023) also adopt RAD for a web-based student admission system, illustrating the methodology's applicability to administrative educational tools, which often require rapid updates to meet institutional needs. Manik, Faizah, and Ginting (2023) extend this application to an Android-based educational math game, emphasizing RAD's role in integrating engaging elements like gamification into learning platforms. These studies collectively affirm RAD's suitability for the iterative and user-focused development of language learning applications. Moreover, the broader implications of RAD in educational digitization are explored by Safrizal and Afkar (2023), who discuss the revitalization of academic information systems as a response to digital education challenges. Their insights into modernizing educational infrastructure through rapid development methodologies underscore the transformative potential of RAD in creating responsive learning environments. Hakim, Faizah, and Nurcahyo (2023), while focusing on the Waterfall method for an academic information system, provide a comparative perspective on development methodologies, reinforcing the advantages of RAD's flexibility over more linear approaches in dynamic educational.

Integrating insights from prior studies on Korean language learning applications enhances the theoretical foundation. Setiawan, Pranoto, and Santi (2020) detail the design of a simple Korean language learning application using Android Studio, emphasizing user-friendly interfaces that cater to beginners. Their work aligns with the goal of creating accessible tools for Korean learners. Similarly, Sirumapea, Panchadria, and Rosmiati (2020) focus on mobile learning applications for Hangeul, reinforcing the importance of script-specific education in language acquisition. Somya and Tjahjono (2016) explore the use of the AndEngine library to create interactive Korean learning media through mini-games, highlighting gamification as a strategy to enhance engagement. Rohman-UBSI and Mandiri (2020) further advocate for game-based interactive Korean learning applications, offering additional evidence of the efficacy of engaging formats in language education. Additional references provide a wider lens on technology's role in education. Firstantin (2019) analyzes Korean learners' fluency in reading texts, underscoring the importance of textual comprehension in language mastery—a key component of the proposed application. Gunarto, Abdullah, and Irawan (2018) and Mohamad Firdaus (2022) offer insights into Java programming applications, which are pertinent given Android's reliance on Java for development. Mubarak (2019) and Mandasari and Kaban (2022) discuss object-oriented programming and RAD in web-based systems, providing cross-applicable principles for mobile app design. Rosaly and Prasetyo (2019) elucidate flowchart concepts, aiding in the procedural design of application workflows.

The convergence of these theoretical perspectives—spanning programming fundamentals, software

engineering practices, RAD methodology, and specific applications in language learning—forms a robust foundation for developing an Android-based Korean language learning application. The emphasis on rapid, iterative development through RAD ensures that the application can be tailored to the specific needs of learners within the "INDOMY" group, a community of Korean culture enthusiasts. By leveraging textual content and focusing on pronunciation through song lyrics, the application aims to address common challenges in Korean language acquisition, such as phonetic accuracy and learner engagement. The integration of interactive elements, inspired by gamification studies, further enhances the potential for sustained user interest. Furthermore, the reliance on offline functionality, as necessitated by the application's design, aligns with the portability and accessibility goals of mobile learning. This approach mitigates barriers posed by inconsistent internet access, ensuring that learners can engage with the material anytime and anywhere. The theoretical insights from operational research and software engineering underscore the importance of optimizing resource use and user experience, critical factors in ensuring the application's efficacy as an educational tool. The theoretical background synthesized from diverse scholarly works provides a comprehensive framework for the design and development of a Korean language learning application. By grounding the project in established programming principles, software development methodologies like RAD, and targeted research on language education, the application is poised to offer a practical, engaging, and accessible solution for Korean enthusiasts. The iterative nature of RAD, coupled with user-centered design principles, ensures that the final product will evolve in response to learner feedback, ultimately contributing to the broader field of mobile educational technology.

3 | METHOD

This research was conducted within the "INDOMY" group, a community comprising Korean culture enthusiasts of various ages, residential locations, and personal commitments. Established on October 25, 2018, via the WhatsApp platform, this group consists of 70 active members who share a common passion for Korean culture, including K-pop, dramas, and language. The study was carried out over a two-month period, specifically from July to August 2023, to ensure a focused timeframe for data collection, analysis, and application development. The primary objective of this research was to design and develop a tailored Android-based application for learning Korean letters and vocabulary, catering to the specific needs and interests of the "INDOMY" group members. To achieve this, a systematic methodology was adopted, incorporating the Rapid Application Development (RAD) approach, which is renowned for its iterative and user-centric framework in software development. RAD was selected as the core methodology due to its emphasis on rapid prototyping, continuous feedback, and adaptability, which are essential for creating an application that aligns closely with user expectations within a constrained timeline. The RAD methodology encompasses several key stages that guide the development process, ensuring efficiency and responsiveness to user needs. These stages, typically illustrated in a structured flowchart, include requirements planning, user design, construction, and cutover. During the requirements planning phase, the research focused on gathering input from the "INDOMY" group to identify their specific learning needs, such as the focus on Hangeul letters and vocabulary from song lyrics. The user design phase involved creating iterative prototypes based on this feedback, allowing for continuous refinement. The construction phase saw the actual coding and development of the application using Android Studio, while the cutover phase involved testing and deployment to ensure functionality on Android devices. Although a specific figure illustrating these RAD stages is not included here, the process followed the standard RAD cycle, ensuring that each iteration incorporated user feedback to enhance the application's usability and effectiveness for Korean language learning.

A critical component of the methodology involved the use of Unified Modeling Language (UML) diagrams to design and visualize the application's structure and functionality. The UML diagrams served as blueprints for the system, facilitating clear communication of design concepts and ensuring that all aspects of the application were systematically planned. The Use Case Diagram, depicted in Figure 1. Fan Usecase Diagram, illustrates the interactions between users (referred to as "penggemar" or fans) and the application, focusing on the main menu interface. This diagram outlines the primary activities required to operate the system, such as accessing learning modules, thereby providing a clear representation of user engagement with the application's features. By mapping out these interactions, the Use Case Diagram ensured that the application's design was user-oriented, addressing the specific functionalities desired by the "INDOMY" group.

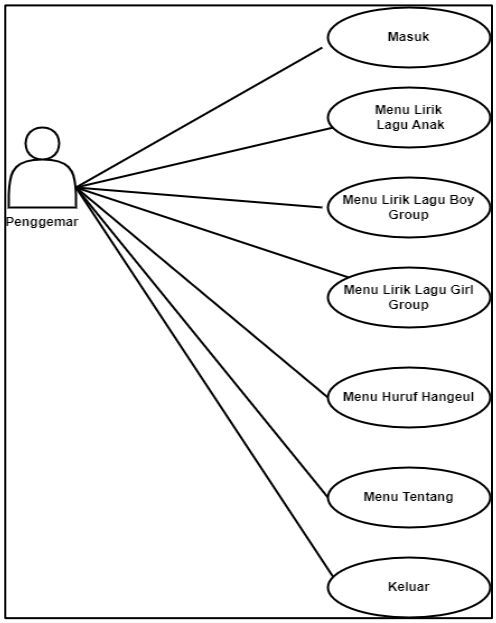

Figure 1. Fan Usecase Diagram

Further detailing the application's workflow, Activity Diagrams were employed to represent the procedural logic and business processes within the system. These diagrams, presented in multiple figures, capture the sequential flow of user actions across different application components. Figure 2. Application Login Activity Diagram illustrates the login process, detailing the steps users take to access the application. Similarly, Figure 3. Main Menu Activity Diagram depicts the workflow associated with the main menu, showcasing navigation options available to users. Additionally, Figure 4. Activity Diagram Menu Hangeul Letters focuses on the specific module for learning Hangeul letters, outlining the steps users follow to interact with this feature. These Activity Diagrams collectively provided a granular view of the application's operational logic, ensuring that each process was intuitive and aligned with user expectations.

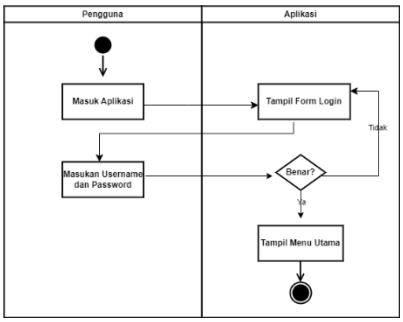

Figure 2. Application Login Activity Diagram

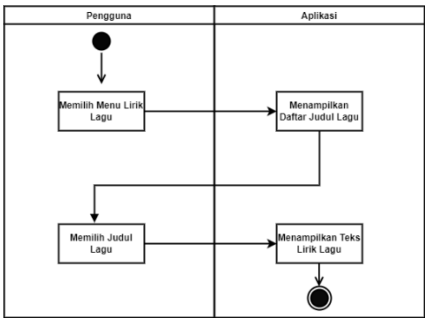

Figure 3. Main Menu Activity Diagram

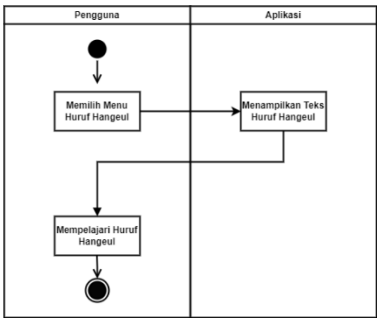

Figure 4. Activity Diagram Menu for Hangeul Letters

To capture the dynamic interactions within the system, Sequence Diagrams were used to illustrate the execution of object interactions over time. These diagrams focus on the simplicity and complexity of system processes, presenting only the essential outlines of interactions. Figure 5. Main Menu Sequence Diagram details the interaction sequence for selecting song lyrics from the main menu, highlighting the flow of data and commands between system components. Similarly, Figure 6. Sequence Diagram of the Hangeul Letter Menu focuses on the sequence of interactions within the Hangeul learning module, ensuring that the process of accessing and learning letters is streamlined and efficient. These Sequence Diagrams were instrumental in identifying potential bottlenecks in user interactions, allowing for preemptive adjustments during the development phase.

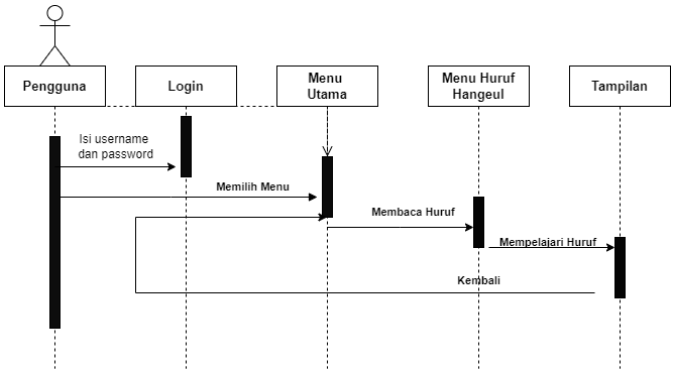

Figure 5. Main Menu Sequence Diagram

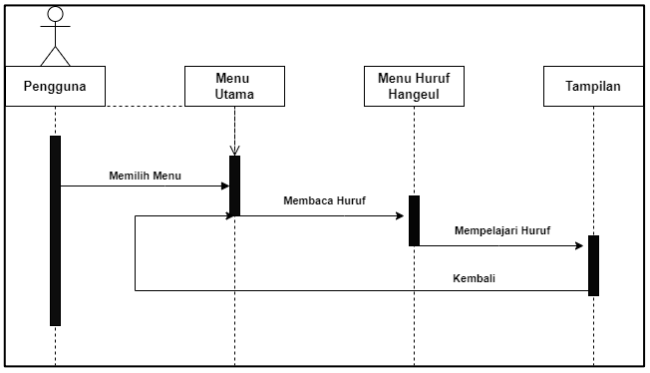

Figure 6. Sequence Diagram of Hangeul Letter Menu

The structural foundation of the application was mapped out using a Class Diagram, which describes the relationships and attributes of classes, packages, and objects within the system. As shown in Figure 7. Application Class Diagram, this diagram provides a comprehensive overview of the application's architecture as implemented on Android devices. It illustrates the interconnections between various system components, ensuring that the design is modular and scalable. The Class Diagram served as a critical tool during the coding phase, guiding developers in structuring the application's backend to support frontend functionalities effectively.

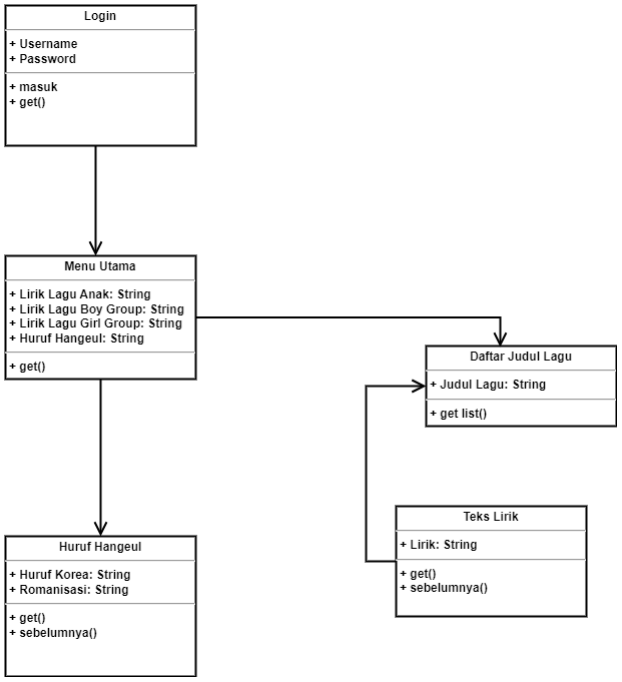

Figure 7. Application Class Diagram

By integrating the RAD methodology with detailed UML diagramming, this research ensured a robust and iterative approach to developing a Korean language learning application tailored for the “INDOMY” group. The combination of rapid prototyping and structured design allowed for continuous refinement based on user feedback, addressing the unique challenges faced by Korean language enthusiasts. The use of specific UML diagrams, as referenced in the figures, provides a clear and systematic framework for visualizing user interactions, workflows, and system architecture, ultimately contributing to the creation of an intuitive and effective educational tool. This methodology not only facilitated the timely development of the application within the July to August 2023 timeframe but also ensured that the final product was closely aligned with the learning objectives and cultural interests of the target community. Through this structured yet flexible approach, the research aims to bridge gaps in accessible Korean language education, offering a practical solution for enthusiasts seeking to master Hangeul and vocabulary through an engaging mobile platform.

4 | RESULTS AND DISCUSSION

4.1 Results

The development of the Android-based Korean language learning application for the "INDOMY" group, a community of Korean culture enthusiasts, has resulted in a user-friendly and culturally engaging platform designed to facilitate the learning of Korean vocabulary and Hangeul letters. This section elaborates on the various interface components and functionalities of the application, providing a comprehensive overview of how each screen contributes to the overall user experience and educational objectives. The application was crafted with the specific needs of the target group in mind, ensuring that navigation is intuitive, and content is accessible without requiring prior registration or complex setup processes. Each interface element was iteratively refined through user feedback during the Rapid Application Development (RAD) process, conducted between July and August 2023, to ensure alignment with the learning preferences and cultural interests of the community. The initial point of interaction for users is the front page of the application, which serves as the entry gateway. This screen is designed for simplicity and accessibility, allowing users to access the application directly by selecting a prominently displayed button that enables entry without the need for prior registration. This feature was intentionally incorporated to remove barriers to entry, ensuring that members of the "INDOMY" group, regardless of their technical proficiency, can immediately begin exploring the educational content. The decision to bypass a registration process reflects the application's focus on user convenience, particularly for a diverse group with varying levels of familiarity with mobile applications, thereby fostering inclusivity and encouraging immediate engagement with the learning material. Upon entering the application, users are directed to the main menu interface, which acts as the central hub for navigation. This screen presents six distinct menu options, each tailored to different aspects of Korean language learning and cultural exploration. Among these, options such as children's songs, boy group songs, and girl group songs are included to cater to varied musical interests within the community. When users select the children's songs category, for instance, they are presented with a list of song titles to choose from, enabling them to study vocabulary embedded within the lyrics of their selected track. Similarly, choosing the boy group or girl group categories directs users to respective lists of popular songs by Korean artists, allowing them to explore pronunciation and vocabulary through familiar and engaging content. This structure not only organizes content effectively but also leverages the cultural affinity of the "INDOMY" group for Korean music, making the learning process both relevant and enjoyable.

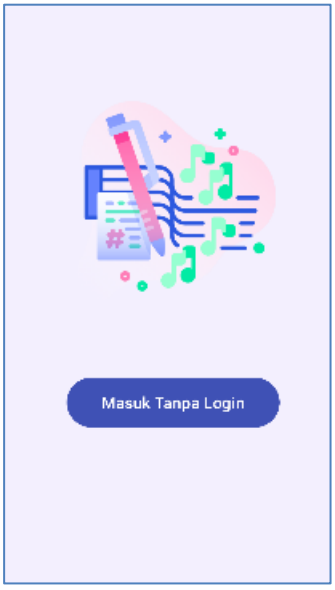

Figure 8. Front Page View

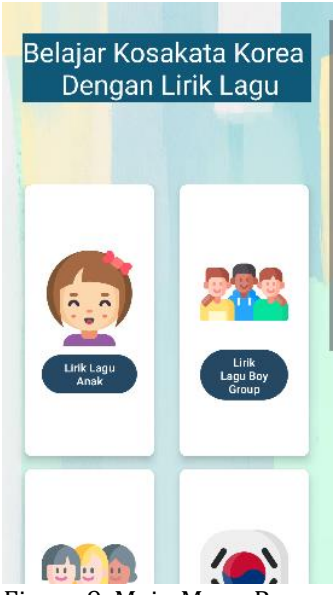

Figure 9. Main Menu Page View

Figure 10. Children's Song Title List Page View

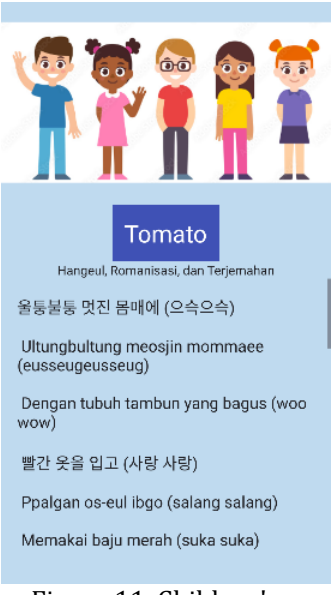

Figure 11. Children's Song Lyrics Page View

Further delving into the song categories, the application features dedicated screens for lists of song titles across the children's, boy group, and girl group genres. Each of these interfaces displays a curated selection of songs, enabling users to pick titles based on personal preference for vocabulary study through lyrics. These screens are accessible directly from the main menu, ensuring a seamless transition between choosing a category and exploring specific content. The design prioritizes clarity, with straightforward layouts that prevent user confusion, allowing

learners to focus on selecting songs that resonate with their interests. This targeted approach ensures that the application remains a personalized learning tool, accommodating the diverse tastes within the community while maintaining a cohesive educational framework centered on language acquisition through music. Specific lyric display screens are provided for each song category, showcasing the full text of selected tracks to facilitate detailed study. For instance, within the children's song category, users can view the lyrics of a song titled "Tomato," which aids in learning basic vocabulary in a simple, memorable context. Similarly, for the boy group category, lyrics from a popular BTS track titled "Spring Day" are displayed, allowing users to delve into more complex vocabulary and emotional expressions typical of contemporary K-pop. In the girl group category, lyrics from Blackpink's "Playing With Fire" are featured, offering insights into dynamic and modern Korean language usage. These interfaces are designed to highlight key vocabulary and pronunciation cues, enhancing the learning experience by contextualizing language within culturally significant content that resonates deeply with the "INDOMY" group's interests.

Figure 12. Boy Group Song Lyrics Page View

Figure 13. Girl Group Song Lyrics Page View

Figure 14. Hangeul Letter Page View

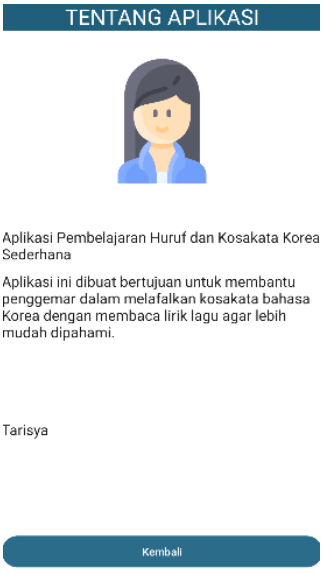

Figure 15. About Page View

Beyond song lyrics, the application includes a dedicated interface for learning Hangeul, the Korean alphabet, which is accessible from the main menu. This screen introduces users to individual Hangeul characters, providing detailed guidance on their pronunciation and usage. The design focuses on clarity and progression, enabling learners to systematically build their understanding of the foundational elements of the Korean language. This feature addresses a critical need for beginners within the community, many of whom may be unfamiliar with the script, by offering a structured and interactive way to master Hangeul as a precursor to more advanced vocabulary and conversational skills. Additionally, an informational screen about the application itself is included to provide context and transparency to users. Accessible from the main menu, this interface offers detailed descriptions of the application's purpose, features, and development background. It serves as a resource for users to understand the educational goals behind the tool and how it was tailored specifically for the "INDOMY" group. This transparency fosters trust and encourages users to engage more deeply with the application, knowing that it was designed with their specific cultural and learning needs in mind. The interface design and functionality of this Korean language learning application reflect a thoughtful integration of user-centered design principles and cultural relevance. By providing intuitive navigation through the front page, main menu, and various content-specific screens, the application ensures accessibility for all members of the "INDOMY" group. The inclusion of diverse song categories leverages the community's passion for Korean music as a vehicle for language acquisition, while the Hangeul learning module addresses foundational literacy needs. Each screen was meticulously developed and refined based on iterative feedback collected during the research period, ensuring that the final product not only meets but exceeds user expectations. This comprehensive approach to interface design underscores the application's potential as an effective educational tool, contributing significantly to mobile learning solutions for language enthusiasts.

4.2 Discussion

The development of an Android-based Korean language learning application for the "INDOMY" community is a strategic effort in utilizing mobile technology to support contextual and interesting foreign language learning.

This application is designed with a Rapid Application Development (RAD) approach, which emphasizes rapid iteration and user feedback, thus ensuring that the final product is in accordance with the needs of the users, namely members of the Korean culture enthusiast community. The main focus of this application is to facilitate the learning of Hangeul letters and vocabulary through popular K-pop song lyrics, which reflect the cultural interests of the community. This discussion will analyze the interface design and functionality of the application based on the results of the study, and relate it to relevant literature to strengthen the argument about the importance of this approach in language learning. One of the key aspects of this application is the intuitive interface design, which allows users to access content without barriers such as complicated registration processes. This approach is in line with the findings of Setiawan *et al*. (2020), which states that Android-based Korean language learning applications must be designed with a simple interface to ensure accessibility for users from various technical backgrounds. In the context of the "INDOMY" community, the front page of the application allows direct access through the login button without registration, eliminating initial barriers that can reduce learning motivation. In addition, the main menu that provides six category choices, including children's songs, boy groups, and girl groups, reflects a user-oriented design, as recommended by Somya and Tjahjono (2016), who emphasize the importance of culturally relevant content in Android-based Korean language learning media. The selection of song lyrics as a medium for vocabulary learning is also supported by Firstantin's (2019) research, which highlights that fluency in reading Korean texts can be improved through exposure to materials that are familiar and meaningful to learners. By providing song lyrics from popular groups such as BTS and Blackpink, this application not only capitalizes on users' interest in K-pop but also creates an authentic learning context. This approach allows users to learn pronunciation and vocabulary in culturally relevant situations, which can increase retention and learning motivation. In addition, the Hangeul letter learning module designed to introduce characters gradually follows the principle of step-by-step learning, as proposed by Sirumapea *et al*. (2020), which emphasizes the importance of a clear structure in mobile learning applications for Hangeul letters.

The development methodology of this application uses the RAD approach, which allows for rapid iteration based on user feedback during the research period from July to August 2023. This approach is in accordance with the findings of Mandasari and Kaban (2022), which stated that RAD is effective in developing user-oriented information systems, because it allows for rapid adaptation to specific needs. In this context, feedback from "INDOMY" members was used to refine the application's interface and content, ensuring that every feature, from the song list to the Hangeul module, met user expectations. The RAD approach is also supported by Atmaja *et al*. (2023), who highlighted that this method is very suitable for projects with tight schedules, such as those implemented in this study, as it allows for rapid prototype development and iterative testing. Furthermore, the use of the Unified Modeling Language (UML) in designing this application ensures that the system structure and flow are designed systematically. As explained by Mubarak (2019), UML serves as an important visualization tool for mapping user interactions and system logic, thus minimizing errors during the development stage. In this application, UML diagrams are used to design the navigation flow from the front page to the main menu, as well as user interactions with the learning modules. This approach is also in line with the recommendations of Pebrianto and Hadi (2023), who emphasize the importance of structured system design to create an efficient and effective user experience in technology-based applications. The app's functionality also includes an information page that provides context about the app's purpose and features, which increases transparency and user trust. According to Zalukhu *et al*. (2023), such informational elements are important in Android-based educational apps, as they help users understand the value and usefulness of the tool. In the context of "INDOMY," this page allows community members to appreciate how the app is specifically designed to meet their Korean language learning needs, which in turn can increase their engagement with the platform.

However, while the app shows promising results, there are some limitations that need to be considered. First, the focus on K-pop song lyrics may not fully cover broader language learning needs, such as grammar or everyday conversation, which are also important for overall language acquisition. Second, the app was developed for a specific community, so generalization to a wider population of Korean language learners may require further adjustment. Future research could explore the integration of additional features, such as grammar exercises or conversation simulations, to complement the existing vocabulary and Hangeul modules. The development of this Korean language learning app shows great potential in leveraging mobile technology to support culture-based language learning. By integrating culturally relevant content, such as K-pop song lyrics, and applying the RAD methodology for responsive development to user needs, this application has succeeded in creating an intuitive and engaging educational tool for the "INDOMY" community. Support from literature such as Setiawan *et al*. (2020), Somya and Tjahjono (2016), and Firstantin (2019) strengthens the argument that a culture-based and technology-based approach is very effective in improving motivation and language learning outcomes. In the future, further development can be focused on expanding features and evaluating the long-term impact of this application on users' language skills, thereby making a more significant contribution to Korean language learning in the digital era.

5 | CONCLUSIONS AND FUTURE WORK

Based on the research findings regarding the design and development of a simple Korean language learning application for letters and vocabulary tailored for the "INDOMY" WhatsApp group on an Android platform, several conclusions can be drawn. The application significantly facilitates the learning process for community members by enabling them to study Korean vocabulary using smartphones as a practical and accessible learning tool. Furthermore, it supports fans in mastering the pronunciation of Korean words effectively through the integration of song lyrics within the app, making the learning experience more engaging and culturally relevant to their interests.

Looking ahead, several avenues for further development can enhance the utility and reach of this application. Future efforts should focus on incorporating modules for grammar and daily conversation to provide a more comprehensive Korean language learning experience. Additionally, conducting long-term studies to evaluate the app's effectiveness in improving users' Korean language proficiency, including speaking fluency and text comprehension, would be beneficial. Expanding the app's content and features to cater to a broader audience of Korean language learners beyond the "INDOMY" community, by including diverse cultural content and varying difficulty levels, is also recommended. Lastly, enhancing interactivity through features such as quizzes, educational games, or voice recording tools for pronunciation practice with instant feedback could further enrich the learning process. Through these initiatives, the Android-based Korean language learning application is expected to evolve into a more holistic educational tool, making a significant impact on foreign language learning in the digital era.

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