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Review Article

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Isenyas: A Basic Filipino Sign Language Educational Mobile Application for Deaf and Mute

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ABSTRACT
This study presents the design, development, and evaluation of iSenyas, an Android-based mobile application aimed at enhancing the learning of basic Filipino Sign Language (FSL) among deaf and mute individuals in Odiongan, Romblon. The primary purpose of the project is to provide an accessible, offline learning tool that can aid in visual language acquisition through a user-friendly interface and culturally relevant content. The application features six main categories, alphabets, numbers, vocabulary, common words, common communications, and nursery rhymes, delivered in visual formats such as images and videos, all interpreted in FSL. Guided by the Agile methodology, the development process included phases of planning, requirements gathering, analysis, interface and content design, implementation, and testing. The project also involved coordination with the Persons with Disability Affairs Office (PDAO) and feedback from actual deaf and mute users. To evaluate the app's performance and user satisfaction, both Unit Testing and User Acceptance Testing (UAT) were conducted using the ISO/IEC 21500:2011 Software Quality Standards. Evaluation data from multiple respondent groups, including deaf and mute individuals, students, and educators, revealed high levels of agreement across all six quality dimensions: functionality, reliability, usability, efficiency, maintainability, and portability. The weighted mean scores ranged from 4.3 to 5.0, with most responses falling under "Strongly Agree." These findings validate iSenyas as an effective educational tool for FSL learning and inclusive communication. However, the study is limited to Android users in one locality, suggesting that future research should explore cross-platform deployment and more interactive features for broader educational impact.

Keywords: Android Mobile Application, Android Versions, Cordova, FSL, ISO 21500:2011

Introduction

Communication is fundamental to human interaction, yet for the deaf and mute community, systemic barriers persist due to a lack of widespread understanding and integration of sign language. In the Philippines, despite the institutionalization of Filipino Sign Language (FSL) through Republic Act No. 11106 in 2018, the language remains underutilized, particularly in rural areas like Odiongan, Romblon. The limited availability of educational and technological resources further marginalizes this population. Recent studies emphasize the role of technology in bridging communication gaps. For instance, Mapote and Dequilla-Nicerio developed "SignSpeak," an application integrating computer vision and speech synthesis to translate FSL gestures into audio and vice versa, underscoring the potential of tech-based solutions for inclusive communication [1]. Similarly, Montefalcon applied deep learning models like ResNet to recognize numeric FSL gestures with high accuracy, demonstrating the viability of computer vision in sign language recognition [2]. The development of iSenyas a mobile app aimed at teaching the basics of FSL aligns with these technological trends. Designed for offline use and tailored to Android platforms, iSenyas caters to the widespread use of mobile devices in the Philippines, particularly in underserved areas. Its design, grounded in Agile methodologies and shaped by feedback from local stakeholders, reflects a user-centered approach essential for educational technologies. Support for mobile-based sign language education is echoed in broader literature. Oropesa proposed the SENYAS system, combining MediaPipe and CNN-LSTM models to recognize real-time FSL gestures [3]. The

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study reported up to 98% accuracy, reinforcing the effectiveness of combining deep learning with gesture recognition for local sign languages. Moreover, Pilare developed a similar FSL gesture recognition system using LSTM algorithms, achieving testing accuracies close to 99%, suggesting high potential for real-world application [4].

Despite these advancements, challenges persist, particularly in user interface design and localization of content. Faisal emphasized the importance of intuitive UI for learners in special schools, while Lartec highlighted systemic issues in integrating FSL within multilingual educational frameworks [5,6]. These findings underscore the need for culturally and linguistically relevant digital tools, like iSenyas, that are not only functional but also inclusive and accessible. Collectively, these works advocate for the strategic integration of mobile technologies in deaf education and support the notion that applications like iSenyas can significantly enhance learning outcomes and social inclusion for the deaf and mute community in the Philippines.

Literature review

Deaf and Mute Communication

Communication barriers have long been a critical issue for the deaf and mute community, prompting extensive research and innovation. Recent developments emphasize leveraging technology for effective interaction. For instance, gesture recognition gloves like the Intersign Glove interpret Indian Sign Language in real-time, converting gestures into audible speech [7]. Artificial intelligence (AI), machine learning (ML), and deep learning (DL) are central to transforming sign language into textual or vocal forms, facilitating more accessible communication [8]. Additionally, the incorporation of real-time scribing and emotion recognition through federated machine learning frameworks has furthered personalized and secure communication systems [9]. These advances collectively highlight a significant move towards inclusive communication frameworks.

Efforts in emotion recognition and AI-driven translation also show promising results in bridging conversational gaps. Studies have integrated AI companions for interactive communication, fostering real-time interaction for users unfamiliar with sign language [10]. Similarly, CNN-based hand gesture detection models have demonstrated significant accuracy improvements in detecting sign language [11]. Deep learning strategies have improved not just gesture recognition but also real-time applications, as showcased in the deployment of Flask-based APIs for dynamic translation [12]. Such technologies indicate a strong trend toward making communication both effective and universally accessible. Another dimension to technological solutions is their focus on real-time communication. A range of CNN, LSTM, and hybrid models now support accurate gesture recognition, making them viable for continuous interactions[13,14]. For example, wearable devices that are self-powered and embedded with advanced sensors present a dual benefit: uninterrupted power supply and accurate gesture detection. This capability ensures that users can communicate without disruption in various social contexts.

Public health and emergency services are also integrating sign language to eliminate communication gaps. Audiologists, for example, are increasingly being encouraged to gain clinical sign language competence to provide better patient care [15]. Likewise, training emergency medical personnel with tools and visual aids significantly improves communication efficacy with deaf patients. These examples highlight that technological advancements must be paralleled by institutional and professional development for holistic impact. Despite these breakthroughs, challenges remain in making these systems commercially viable and universally accessible. As noted, limitations in ASL proficiency among social workers can hinder service delivery. Hence, in addition to technological innovation, educational and policy-level changes are necessary to ensure consistent and inclusive communication environments.

Filipino Sign Language (FSL)

Filipino Sign Language (FSL) remains a vital, though under-researched, area in communication for the deaf community in the Philippines. It is uniquely structured, with its own grammar and syntax, and varies significantly from both American Sign Language and spoken Filipino. Despite being the national sign language, FSL lacks mainstream integration, particularly in public education and health communication. emphasize the scarcity of research on non-manual signals like facial expressions and body language in FSL, which are crucial for conveying nuanced meanings. Recent studies underscore the need for dedicated tools and platforms that incorporate these unique linguistic elements. Projects like TEXT2FSL and SiTa utilize text analysis algorithms to convert written Filipino or English text into corresponding FSL signs, thus making educational resources more accessible [16]. Tools integrating video-based tutorials and adaptive feedback mechanisms are helping learners grasp both manual and non-manual components of FSL.

Moreover, the deployment of AI models trained specifically on FSL datasets can potentially overcome the limitations posed by lack of standardization in facial and bodily expressions. Such models would ideally account for the dynamic and contextual nature of sign expressions, improving both recognition and generation of FSL signs. Societal awareness and professional competence in FSL remain low. Studies show that many Filipino audiologists and healthcare workers lack exposure to clinical FSL, limiting their effectiveness when working with deaf patients. The situation mirrors global patterns where clinicians, despite receiving general sign language training, often miss specialized vocabulary needed for clinical settings [15]. Future directions for FSL include developing curricula that integrate both language and cultural context, training more interpreters, and implementing digital tools in schools and clinics. As access to education and employment often hinges on communication ability, enhancing FSL literacy across sectors is essential for inclusiveness.

Mobile Technology and Applications

Mobile technology has significantly advanced the educational and social inclusion of individuals with disabilities. In the context of deaf and mute communication, mobile applications have emerged as critical tools for learning and interaction. notes the appeal of dynamic, interactive environments for younger users, which mobile apps effectively provide. Apps like E-Tutor and i-Sign incorporate videos, quizzes, and gamified modules that cater to different learning styles.

AI-enhanced applications are gaining traction due to their ability to personalize learning experiences. These tools utilize user performance data to adapt content delivery, ensuring that users with varying cognitive and linguistic capabilities receive tailored support. Such personalized systems not only improve comprehension but also promote sustained engagement. Furthermore, apps are being developed with bilingual or multimodal features. For instance, some platforms allow switching between text, audio, and sign language modes, facilitating multi-sensory learning and reinforcing knowledge retention. These features are particularly beneficial for early learners and individuals transitioning from oral to visual language systems.

However, technological accessibility remains a challenge. While apps may be available on Android and iOS platforms, affordability and internet connectivity limit widespread adoption in underserved regions. Developers are thus increasingly focusing on offline functionality and lightweight app architecture to mitigate these issues. To maximize impact, collaboration between software developers, linguists, and special education professionals is essential. This interdisciplinary approach ensures that applications are not only technically robust but also pedagogically sound and culturally sensitive.

Mobile & Web Applications for Disabled Persons

Mobile and web applications for disabled persons are pivotal in addressing educational gaps and promoting social inclusion. Samonte illustrates this with a preschool-level application that uses speech and character recognition to teach basic concepts to children with speech and hearing impairments. The involvement of SPED teachers and parents in app testing ensured that the tool met real-world educational needs. Other examples include the Krisha app, developed for autistic children, which integrates life skills training through interactive games. While primarily designed for autism, the underlying framework can be adapted for deaf and mute learners, showcasing the versatility of mobile-based interventions.

Moreover, the use of sensors and IoT devices has led to innovations like smart gloves and gesture-recognition wearables. These devices capture user gestures and translate them into speech or text in real-time, providing a bridge between non-verbal and verbal communication [11]. Integrating these technologies into classroom and therapy settings improves accessibility and learning outcomes. Applications that combine visual, auditory, and tactile feedback can address multiple learning modalities, enhancing overall user experience and effectiveness. Despite the promising outcomes, developers face challenges related to scalability, maintenance, and user support. Continuous updates, language localization, and culturally sensitive content are crucial for broader adoption and efficacy across diverse user groups.

Application for Deaf and Mute Sign Language

Applications specifically designed for sign language education and communication have become increasingly sophisticated. Garcia introduced the E-Tutor for Filipino Sign Language, which provides video-based learning modules and self-assessment tools. Similarly, i-Sign uses gamification to make the learning process engaging and effective. Advanced tools now integrate AI for real-time translation and interaction. For example, the ActiveCNN-SL framework demonstrates how AI can refine gesture recognition through iterative human feedback, achieving near-perfect accuracy [17]. Such tools are instrumental in fostering bidirectional communication between deaf and hearing individuals.

Innovative projects like TEXT2FSL and SiTa go beyond learning to practical application, enabling real-time translation of text into FSL signs. These tools play a crucial role in educational settings, especially for integrating deaf students into mainstream learning environments. IoT and wearable technologies are increasingly being integrated into these systems. Smart gloves with embedded sensors, for instance, translate hand gestures into digital voice, improving communication efficiency [7]. These tools enhance not only personal communication but also professional and public interactions. While these innovations show significant promise, the cost of production and technical maintenance continues to impede widespread deployment. Future research should focus on open-source development and government-funded initiatives to enhance scalability and accessibility.

Sign Language Translation Tools

The development of sign language translation tools represents a major advancement in communication technology for the deaf and mute community. Tools like Sign Language Translator (SLT) employ smartphones to capture hand gestures and translate them into text with impressive accuracy. Using deep learning models like VGG16, SLT has shown high reliability in real-time environments [10]. More recent innovations involve the use of LSTM networks and attention mechanisms to improve translation precision. These systems process video inputs to capture both spatial and temporal elements of gestures, leading to more nuanced interpretations. Such tools are particularly effective for recognizing continuous signing sequences, which traditional systems often struggle with.

Cross-language translation is another area of growth. Applications are now being developed to convert between different sign languages, such as from American Sign Language to Filipino or Arabic Sign Language. These cross-linguistic capabilities open up new opportunities for international collaboration and education. Translation tools are increasingly being integrated into public services. For example, some emergency response systems now use visual aids and sign language translation software to communicate with deaf individuals. These systems reduce the risk of miscommunication during critical interactions. Despite technological progress, there is still a need for standardization and extensive user testing to ensure these tools perform well across diverse contexts. Developers must also address data privacy and user autonomy, particularly in healthcare and legal settings where sensitive information is involved.

Inclusive Education for Deaf Students

Inclusive education fosters learning environments where all students, including those with disabilities, have equitable opportunities to succeed. For deaf students, however, mainstream education presents significant challenges such as insufficient interpreter services, inadequate learning materials, and unprepared teaching staff. These obstacles often contribute to lower academic outcomes and increased social isolation. As Hendry observed, even when deaf students achieve comparable grades to their hearing peers, they continue to face difficulties accessing higher education due to limited accommodations and social integration [18]. To address these issues, educational reforms must integrate Universal Design for Learning (UDL) principles, which advocate flexible teaching approaches that accommodate diverse learning needs. Rohatyn-Martin and Hayward noted that deaf students in inclusive classrooms often experience fatigue from constantly trying to interpret auditory information [19]. UDL suggests the use of visual and kinesthetic instructional methods to reduce this cognitive load. Recognizing the linguistic and cultural identity of deaf communities is equally important. Incorporating native sign languages such as Brazilian Sign Language (LIBRAS) or Zambian Sign Language (ZSL) into the curriculum supports bilingual education and improves comprehension. Research by Ligeski affirms that visual pedagogy and bilingual instruction enhance the inclusivity of deaf education [16]. In the wake of the COVID-19 pandemic, studies have explored how shifts to hybrid and online learning impacted accessibility for deaf students.

While these models introduced new challenges, they also enabled innovations such as digital captioning and remote interpreting. Tufar highlighted these developments as both barriers and opportunities [20]. Similarly, Diaz emphasized the role of peer support, individualized interventions, and assistive technologies in promoting academic engagement and social inclusion [21]. Ultimately, the success of inclusive education depends on institutional commitment and policy support. Alsalem and Alzahrani call for collaborative efforts across sectors, the implementation of individualized education programs (IEPs), and systemic changes to ensure accessibility [22]. These findings highlight the need for culturally responsive, well-resourced, and inclusive practices that respect the linguistic rights and diverse needs of deaf learners.

Agile Practices in Mobile App Development for Assistive Technologies

Agile methodologies, particularly Scrum, have become increasingly popular in mobile app development because of their iterative and user-centered approach. In the field of assistive technology, agile methods offer a structured way to quickly gather and implement feedback from users with disabilities, ultimately improving accessibility and usability. Carvalho showed that Scrum enabled small technology companies to efficiently manage development cycles for specialized products like assistive tools [23]. User-centered agile development has shown particular effectiveness in applications designed for individuals with cognitive and communication impairments. For instance, Puspitasari applied both Scrum and user-centered design in creating MIKA, a language learning app for Indonesian children with autism [24]. Through regular sprint reviews and iterative testing with professionals, the development process aligned well with therapeutic goals.

Gamification and adaptive authoring tools have also benefited from agile frameworks. Hammami described the development of a gamified authoring platform using Scrum, designed for non-technical educators [25]. This method enhanced engagement and motivation in designing learning activities, particularly in flipped classroom settings. Agile co-design practices have also improved mobile health (mHealth) applications. Fox emphasized the importance of iterative development in their dementia-supporting app, which underwent several user-driven revisions [26]. Engaging individuals with cognitive impairments in each development phase helped identify and address usability issues that may have otherwise been missed.

Additionally, agile methods have proven useful in multi-stakeholder projects. Tessarolo reported on the CAPTAIN project, which utilized a hybrid Agile framework across five Living Labs to develop ambient assisted living technologies [27]. The high satisfaction levels and strong stakeholder involvement underscored the approach's effectiveness in complex, collaborative environments. When combined with co-creation and continuous user testing, agile development not only accelerates delivery but also enhances inclusivity, ensuring that mobile applications for people with special needs are functional, accessible, and impactful.

Methodology

This study employed a developmental research design guided by the Agile software development methodology. The process was structured into five key stages: planning and requirements gathering, analysis, design, implementation, and testing. Each stage played a vital role in the successful creation of iSenyas, a mobile application designed to aid deaf and mute individuals in Odiongan in learning basic Filipino Sign Language (FSL).

Research Design and Development Approach

The researchers employed a developmental research design, particularly suited for building and assessing educational software solutions. Developmental research involves designing a product and systematically evaluating it through multiple stages of improvement and user feedback. This was further operationalized through the Agile software development model, a widely accepted iterative approach that emphasizes collaboration with end-users, continuous feedback, and incremental releases. Agile was selected because of its flexibility and user centered nature, allowing the proponents to refine the application iteratively based on direct input from the target community. Agile's core phases Planning, Design, Development, and Testing were followed rigorously, with each sprint delivering specific functionalities and learning modules to be tested and improved.

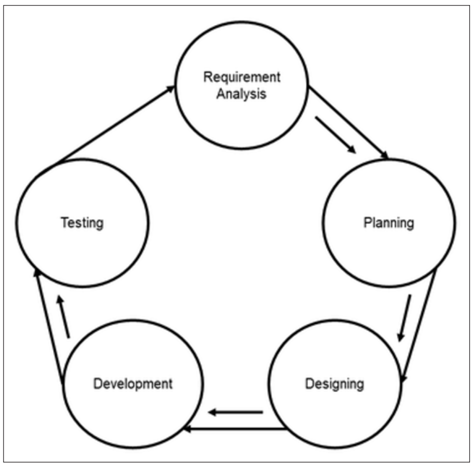

Figure 1: Agile Methodology Cycle

Sampling Method

The research used purposive sampling to select key respondents who could provide valuable insights into the application's effectiveness. Participants included:

- Ten (10) deaf and mute individuals from various barangays in Odiongan;
- Faculty members from Odiongan National High School and Odiongan North Central Elementary School;
- One (1) student from the RSU Institute of Information Technology.

These groups were chosen because of their direct experience or involvement in FSL education or usage.

Research Phases

Planning and Requirements Gathering

The planning phase focused on identifying the problem space, understanding user needs, and gathering technical and contextual requirements for app development. Interviews were conducted with representatives from the Persons with Disability Affairs Office (PDAO) of Odiongan to understand the learning preferences, communication barriers, and accessibility challenges faced by the local deaf and mute population. According to local records, there are approximately 95 deaf and mute individuals in Odiongan, affirming the need for a localized and culturally relevant learning tool.

A Fishbone Diagram was used to categorize root causes of the communication gap, including limited educational tools, lack of awareness, and absence of inclusive technologies. The team also reviewed existing sign language learning applications, such as ASL Pocket Sign and Filipino Sign Language apps, to benchmark common features and identify usability gaps. These insights guided the prioritization of app components and helped refine the objectives of iSenyas.

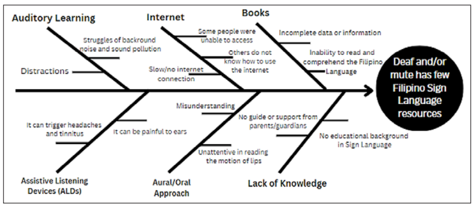

Figure 2: Fishbone Diagram

Analysis Phase

- This stage included the development of:
- A Use Case Diagram to define user interaction;

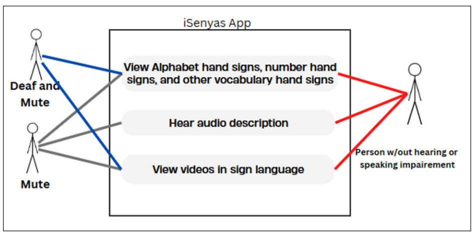

Figure 3: Use Case Diagram

This diagram identified the primary actor (the Learner, who could be deaf/mute or a hearing person learning FSL) and the interactions available: viewing Alphabet, Numbers, Vocabulary, Phrases, Rhymes, etc. The use case diagram clarified what functionalities the app needed to support and ensured the app's scope matched user expectations. It essentially shows that a user can navigate through different content categories and access help/about sections covering all use scenarios of iSenyas.

A Context Diagram to understand system boundaries and data flow

A context diagram was drawn to depict iSenyas as a system and how it interfaces with external entities. Since iSenyas is an offline stand-alone mobile app, the context diagram is simple: the User supplies input (touch interactions) and receives output (visuals, sounds), without any external databases or internet services involved. The context emphasizes the app's front-end nature – everything the user needs is contained within the app on the device.

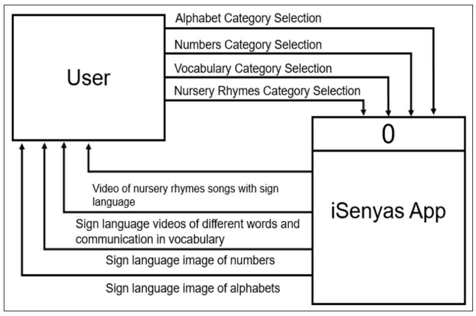

Figure 4: Context Diagram

An Activity Diagram illustrates the sequential flow of app usage

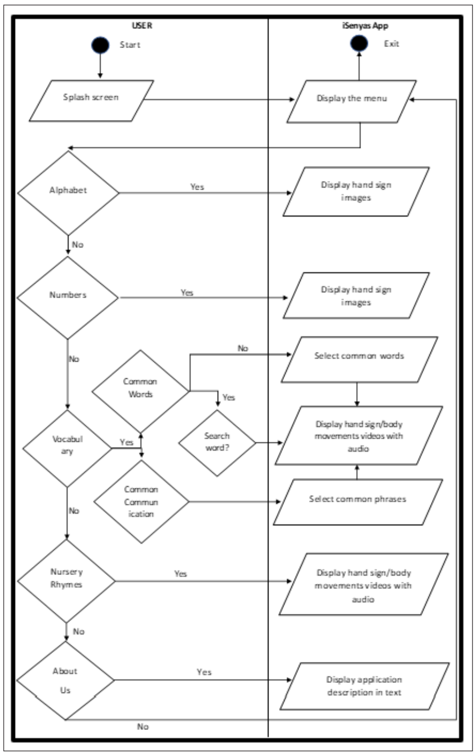

Figure 5: Activity diagram

These tools clarified how the app would be used and what functionalities were most essential.

Design Phase

Given that the app relies heavily on media files (images and videos), no database or ER diagram was created. Instead, all media content was stored locally within the application. File naming conventions were standardized to ensure consistency in the user interface. All categories Alphabet, Numbers, Vocabulary, Common Communication, and Nursery Rhymes were embedded as interactive modules.

Implementation Phase

The app was developed using Cordova, with compatibility for Android versions from Nougat (7.0) to Red Velvet Cake (Android 11). The development was carried out on a Windows 10 PC with 16GB RAM and an Intel i5 processor. Media content, including hand sign images and FSL video clips, was produced and integrated into the app.

Figure 6: Splash Screen, Main Menu and Letters Screen

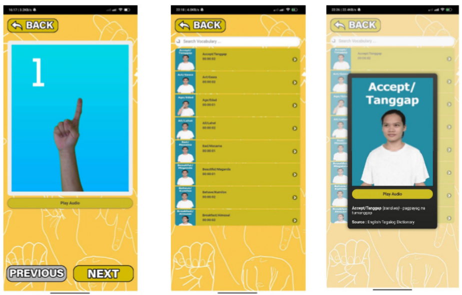

Figure 7: Numbers Screen, List of Words Screen and Words Interpretation Screen

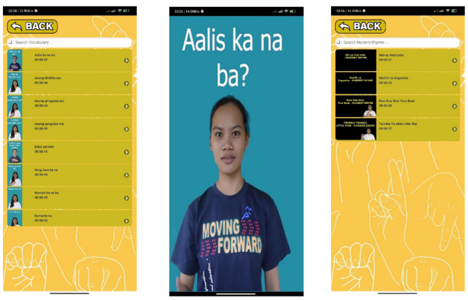

Figure 8: List of Phrases Screen, Phrase Interpretation Screen & Nursery Rhymes Screen

Testing Phase

Testing for the application was carried out in two distinct phases: Unit Testing conducted by the developers and User Acceptance Testing (UAT) performed by actual end-users. During these phases, all essential features of the app including navigation menus, video and audio playback, and smooth transitions between categories were evaluated using test cases aligned with expected user behaviors. To ensure a thorough assessment of the application's quality, the researchers adopted the ISO/IEC 21500:2011 Software Quality Model, which encompasses six core quality attributes: functionality, reliability, usability, efficiency, maintainability, and portability. Functionality measured the app's behavior under normal conditions, while reliability evaluated the consistency of its performance and absence of errors. Usability focused on how easily users could navigate and learn the app, and efficiency assessed its speed and responsiveness. Maintainability referred to the ease with which the app could be updated or debugged, and portability examined its compatibility across different devices and screen sizes. To gather feedback, participants completed an evaluation questionnaire based on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The weighted mean scores computed for each quality attribute revealed a high level of user satisfaction. In particular, the app received strong agreement ratings in usability, functionality, and portability, thereby affirming its effectiveness as an educational tool for learning Filipino Sign Language.

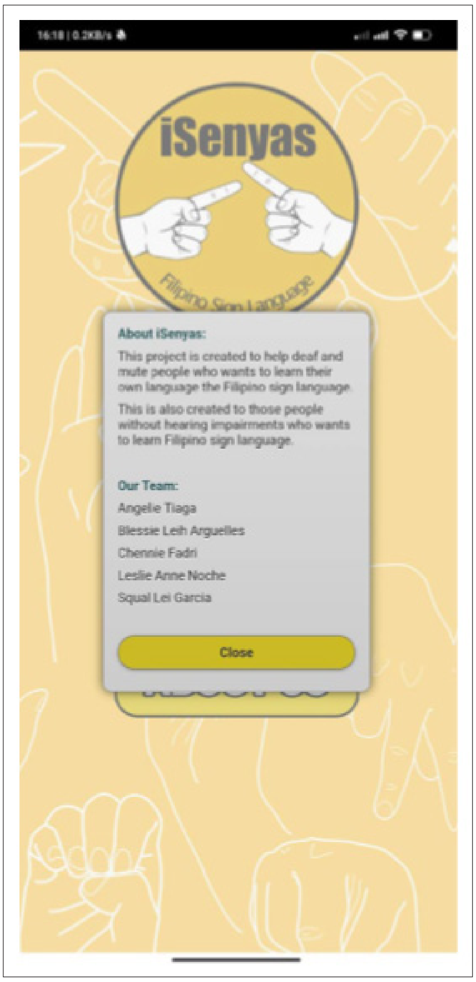

Figure 9: About Screen

Findings and Discussion

The study underscores the critical role of communication, particularly for individuals with disabilities such as those who are deaf and mute. The data collected from Odiongan highlights a growing population of 95 deaf and mute individuals, with varying demographics and educational backgrounds. This growing number, coupled with a lack of resources and knowledge for learning Filipino Sign Language, emphasizes the need for effective educational tools. The iSenyas application was developed to address these needs. The following table presents the findings from our study, demonstrating that iSenyas effectively meets its objectives and provides a valuable and engaging learning experience for its users.

Table 1: Functionality Evaluation

Respondent Group	Weighted Mean	Verbal Interpretation
Deaf and Mute – Odiongan National High School	4.9	Strongly Agree
Faculty of RSU IIT	4.8	Strongly Agree
RSU-Main Campus Students	4.7	Strongly Agree
Odiongan North Central Elementary School (Faculty)	5	Strongly Agree
Odiongan National High School (Faculty)	5	Strongly Agree
Deaf and Mute – Odiongan North Central Elementary School	4.3	Agree

Most respondent groups, including faculty from Odiongan North Central Elementary School and Odiongan National High School, strongly agree on the application's functionality, indicating it works properly and provides relevant information about sign language.

Table 2: Reliability Evaluation

Respondent Group	Weighted Mean	Verbal Interpretation
Deaf and Mute – Odiongan National High School	4.7	Strongly Agree
Faculty of RSU IIT	4.4	Agree
RSU-Main Campus Students	4.9	Strongly Agree
Odiongan North Central Elementary School (Faculty)	5	Strongly Agree
Odiongan National High School (Faculty)	5	Strongly Agree
Deaf and Mute – Odiongan North Central Elementary School	5	Strongly Agree

Reliability scores are generally high, with the highest being from Odiongan North Central Elementary School faculty and students, reflecting confidence in the application's design and performance.

Table 3: Efficiency Evaluation

Respondent Group	Weighted Mean	Verbal Interpretation
Deaf and Mute – Odiongan National High School	4.8	Strongly Agree
Faculty of RSU IIT	4.0	Agree
RSU-Main Campus Students	4.6	Strongly Agree
Odiongan North Central Elementary School (Faculty)	5	Strongly Agree
Odiongan National High School (Faculty)	5	Strongly Agree
Deaf and Mute – Odiongan North Central Elementary School	4.0	Agree

The application is rated highly for efficiency by most groups, particularly faculty from Odiongan North Central Elementary School and Odiongan National High School, indicating fast performance and low system requirements.

Table 4: Usability Evaluation

Respondent Group	Weighted Mean	Verbal Interpretation
Deaf and Mute – Odiongan National High School	4.8	Strongly Agree
Faculty of RSU IIT	4.6	Strongly Agree
RSU-Main Campus Students	4.9	Strongly Agree
Odiongan North Central Elementary School (Faculty)	5	Strongly Agree
Odiongan National High School (Faculty)	5	Strongly Agree
Deaf and Mute – Odiongan North Central Elementary School	4.0	Agree

Usability scores are generally high, especially among faculty from Odiongan North Central Elementary School and Odiongan National High School, showing that the application is user-friendly and visually appealing.

Table 5: Maintainability Evaluation

Respondent Group	Weighted Mean	Verbal Interpretation
Deaf and Mute – Odiongan National High School	4.4	Agree
Faculty of RSU IIT	4.6	Strongly Agree
RSU-Main Campus Students	4.9	Strongly Agree
Odiongan North Central Elementary School (Faculty)	5	Strongly Agree
Odiongan National High School (Faculty)	5	Strongly Agree
Deaf and Mute – Odiongan North Central Elementary School	4.7	Agree

The highest maintainability scores are from RSU-Main Campus Students and faculty from Odiongan North Central Elementary School and Odiongan National High School, indicating that the application performs well even with updates and changes.

Table 6: Portability Evaluation

Respondent Group	Weighted Mean	Verbal Interpretation
Deaf and Mute – Odiongan National High School	4.6	Strongly Agree
Faculty of RSU IIT	4.2	Agree
RSU-Main Campus Students	4.6	Strongly Agree
Odiongan North Central Elementary School (Faculty)	5	Strongly Agree
Odiongan National High School (Faculty)	5	Strongly Agree
Deaf and Mute – Odiongan North Central Elementary School	4.0	Agree

Portability scores are high, especially for faculty from Odiongan North Central Elementary School and Odiongan National High School, indicating good compatibility and ease of installation across different devices.

Conclusion

The iSenyas mobile application represents a significant step forward in addressing the communication barriers faced by the deaf and mute community in Odiongan. This research highlights the critical need for educational tools that facilitate learning Filipino Sign Language (FSL) and emphasizes the potential of iSenyas in meeting this need. Our study reveals a growing population of 95 deaf and mute individuals in Odiongan, with a substantial portion lacking access to effective FSL learning resources. The iSenyas app, through its user-friendly interface and comprehensive content, has proven to be a valuable tool in bridging this communication gap.

The findings confirm that iSenyas meets its objectives by providing an enjoyable and effective means for users to learn FSL. The app's design, incorporating pictures and videos, aligns with the educational needs identified in the community, offering a significant contribution to FSL education and accessibility. The successful implementation of the iSenyas app not only addresses immediate educational needs but also sets a precedent for similar initiatives in other regions.

However, this study acknowledges some limitations, such as the relatively small sample size and the specific geographic focus on Odiongan. Future research could expand to other areas, exploring the app's effectiveness in diverse contexts and its long-term impact on users' proficiency in FSL. Additionally, further investigation into user feedback and potential app enhancements could provide deeper insights into improving the application's functionality and reach [28-33].

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