SOUND CHECK: AN APP FOR ENHANCING ORAL READING FLUENCY

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ABSTRACT

This study developed and evaluated the *Sound Check App*, an e-based instructional tool designed to enhance the oral reading fluency of Grade 7 struggling readers. The application was developed using the *ADDIE* (Analysis, Design, Development, Implementation, and Evaluation) model to address reading difficulties through features such as AI-generated voice support, offline accessibility, highlighted reading text, and user-friendly navigation. A developmental research design was employed, involving selected Grade 7 struggling readers and teacher evaluators who assessed the application's quality in terms of user-friendliness, security of users' data, stability, and educational impact. Data were collected using structured evaluation instruments and analyzed through descriptive statistics, specifically mean and standard deviation, to determine the level of acceptability of the developed application. The findings revealed that the Apple Sound Check App obtained very high acceptability ratings across all evaluation criteria, particularly in interface simplicity, data security, offline accessibility, and support for reader readiness, indicating its effectiveness as an instructional tool for improving oral reading fluency. Although regular software maintenance received comparatively lower ratings, it remained within acceptable levels, suggesting the need for continued system updates and enhancements. Based on the findings, it was concluded that the developed application is an effective, reliable, and user-friendly digital tool that supports oral reading development among struggling readers. It was recommended that future improvements include strengthening system maintenance, integrating AI-generated voice aligned with the Filipino accent, incorporating synchronized word-highlighting features, expanding instructional content, enhancing accessibility features, and conducting further studies to validate the application across broader educational settings.

Keywords: *Oral Reading Fluency, e-Based Learning Application, Struggling Readers, Digital Reading Intervention, Educational Technology Innovation*

Introduction

Reading fluency was the ability to read with speed, accuracy, and prosody. It was a key predictor of comprehension and academic success, particularly among secondary learners who encounter complex texts (Binaloga, 2024). Paige (2020) emphasized that reading fluency was composed of the rate of reading, the accuracy at which words were pronounced, and the prosody or expression used in oral reading. He further noted that correctly pronouncing words was important in maintaining a smooth reading rate because when readers stop to figure out how to say a word, the flow of reading was interrupted. Thus, these challenges were further compounded by grammatical limitations, difficulties in conversational structure, and issues with accuracy detection, all contributing to hindered oral reading fluency cited from Canuto, et al. (2024).

In fact, as observed in the actual classroom settings, students struggled oral reading due to lacked of accuracy and pronunciation skills, unaware of proper phrasing and slow reading speed indicated poor phonological awareness and word recognition led to slower growth in Oral Reading Fluency among students. There were a lot of unfamiliar words to them because of less exposure to English reading. Hence, sounds blending was a challenged resulted to stammering, overtime reading duration and bird-like talked as most of reading teachers named this kind of reading performance by the students. These were the cause of significant gaps in oral reading fluency, which were attributed to several factors, including minimal language exposure, and limited access to reading resources. Therefore, students had shown oral reading gap and needed intervention to treat their skills from deficiency to fluency.

Addressing this gap required targeted, context-responsive interventions that strengthen literacy outcomes (Basali, 2024).

Hence, the researcher was prompted to undertook this study to remediate the identified gaps in oral reading fluency experienced by most students through the developed Sound Check Reading App with the framework of ADDIE model.

Review of Literature

Oral Reading Fluency in Secondary Education

Oral reading fluency (ORF) was considered a crucial bridge to reading comprehension, yet it was often overlooked in English reading programs for second language learners despite theoretical backing from frameworks like behaviorism and automaticity theory (Aldhanhani & Abu-Ayyash, 2020). In addition, behavioral issues like disengagement and uncooperative attitudes hinder effective comprehension (Apiles, 2024). This oversight created a significant gap in educational approaches, particularly for Filipino secondary learners. Key components of ORF, such as accuracy, automaticity, and prosody, were vital for developing reading proficiency among English as a Second Language (ESL) learners (Ocampo, et al., 2025), contributing to a deeper understanding of textual content and enhanced communication skills (Canuto, et al., 2024). For instance, a study in Pakistan revealed an average ORF rate of 72 WCPM (Words Correct Per Minute) among Grade 7 ESL learners, significantly below the estimated benchmark of 97-112 WCPM, indicating a severe lack of systematic reading practice in public schools (Dogar, et al., 2025).

Many learners of ESL and EFL struggled with reading proficiency due to limitations in vocabulary, fluency, comprehension strategies, and confidence, while traditional reading instruction often lacked the flexibility to meet diverse learner needs, the used of artificial intelligence powered tools to support English reading development, with the aim of identifying the types of tools being used, evaluating their effectiveness, and examining implementation challenges as cited by Qi, et al., (2025).

However, phonological interference stemming from a learner's first language and other acquired languages significantly affects English pronunciation, intonation, and overall fluency, especially for multilingual secondary school students. This supported

the inclusion of pronunciation as a meaningful component of oral reading fluency. Studies affirmed its importance. Hambamo, et al. (2022) found strong correlations between reading rate, accuracy, and comprehension, while Fabillaran (2024) highlighted the combined influence of oral fluency and vocabulary on Filipino learners' performance. Developing these skills fosters efficiency and confidence in reading (Wilang et al., 2025).

Despite ongoing research into language proficiency, there was a notable gap in systematically understanding how specific instructional methodologies, such as Task-Based Learning (TBL), influence measurable aspects of speaking fluency in English as a Second Language (ESL) contexts, including speech rate, pauses, and utterance length (Dogar, et al., 2025). Equally, investigations in other English as a Foreign Language (EFL) context, such as South Korea, confirmed that a considerable proportion of secondary learners struggle with oral reading fluency like only 30% of eighth-grade EFL students were able to read independently, highlighting widespread difficulties in areas like word reading accuracy, automaticity, and prosody (Hwang & Lee, 2023).

International research revealed that structured interventions such as repeated reading, guided oral reading, and scaffolded fluency instruction can significantly improve fluency even among adolescents (Reed, 2022). Despite this evidence, a persistent gap existed in secondary education settings, where teachers often assume that fluency has fully developed in earlier grades, resulting in minimal diagnostic assessments and limited fluency-based interventions for older students according to Asdam, et al. (2024).

Fluent reading involved three elements: accurate reading of connected text, and the ability to recognized or decoded words correctly; Reading rate refers to both word-level automaticity and speed in reading text; and Proper phrasing features was duration that contribute to expressive reading of a text. Wolters et al. (2022) conducted a meta-analysis and found an overall moderate relationship between reading prosody and reading comprehension. Their review strengthened the claim that prosodic elements of oral reading, such as phrasing, intonation, and pausing, were meaningfully associated with reading performance. This supports the inclusion of phrasing as a core component of oral reading fluency rather than treating fluency as speed alone. These elements explained how fluency could be assessed and taught effectively which were incorporated to the developed Sound Check App to addressed the existing problem in reading.

As revealed by Sharifuddin (2024), technologies offer promising opportunities to enhanced instruction. Therefore, it addressed a gap in the literature regarding innovative approaches to fostering these skills through emerging technologies (Shafiee Rad, 2025). ORF had examined as not only as a unified construct but also through its individual components—accuracy, phrasing, pronunciation, and rate. Understanding these elements separately provides insight into how fluency developed and how educators could design targeted interventions to improve reading performance.

Oral Reading Fluency Components:

Accuracy

The ability to correctly identify and pronounce words, was foundational to fluent reading. Recent research emphasized the role of decoding automaticity and error correction in improving accuracy. Kim and Wagner (2021) found that word recognition accuracy strongly predicted comprehension outcomes in early readers. Also, O'Connor et al. (2022) demonstrated that explicit phonics instruction and corrective feedback significantly enhance reading accuracy among struggling readers.

Phrasing

Involved grouping words into meaningful units that reflected syntax and semantics. Studies had shown that phrasing contributed to comprehension by supporting syntactic parsing and expressive reading. Rasinski and Young (2020) highlighted that instruction focusing on prosody—through modeled reading and performance-based tasks—improves phrasing and comprehension. In a longitudinal study, Paige et al. (2023) reported that students who developed stronger phrasing skills demonstrated higher comprehension growth over time.

Pronunciation

Was particularly relevant in multilingual and second-language contexts. Research by Taguchi and Gorsuch (2021) indicated that repeated reading combined with auditory modeling improves pronunciation and fluency among English language learners. Similarly, Lin and Chang (2024) found that integrating pronunciation-focused feedback into fluency instruction enhances both intelligibility and reading confidence. These findings underscore the interdependence between pronunciation and overall fluency development.

Rate/Speed

This often measured in words per minute, reflects the automaticity of decoding and the efficiency of word recognition. However, recent studies caution against overemphasizing speed at the expense of comprehension. Fuchs et al. (2020) argued that optimal fluency instruction balances rate with accuracy and expression. In a meta-analysis, Hudson and Torgesen (2025) concluded that moderate increases in reading rate, when accompanied by comprehension monitoring, yield the most sustainable fluency gains.

Furthermore, integrating the components, these emphasized that the four components: accuracy, phrasing, pronunciation, and rate, operate synergistically. Effective fluency instruction integrated these dimensions through repeated reading, modeling, and performance-based assessments. Rasinski et al. (2022) proposed a multidimensional fluency framework that accounts for both cognitive and expressive aspects of reading, offering a more holistic approach to fluency development.

Additionally, Oral Reading Fluency had increasingly focused on its individual components, revealing their distinct yet interconnected roles in reading development. Accuracy ensures correct decoding, phrasing supports syntactic understanding, pronunciation enhances clarity, and rate reflects automaticity. Lastly, together, these elements formed the foundation of fluent, expressive, and meaningful reading. Continued exploration of each component would further refined instructional practices and assessment tools in literacy education.

Level of Acceptability of the developed 'Sound Check' app

Evaluating the level of acceptability of Sound Check app required examining several indicators, including functionality, impact to the society, security of user's data, stability, and user-friendly interface. Previous studies and literature provided insights into how these factors influenced educational effectiveness.

Functionality

This was how effectively an application performed its intended tasks and supported learning objectives. In earlier studies, functional literacy applications were found to improve reading fluency when they incorporated features such as audio playback, pronunciation feedback, and progress tracking. Alqahtani and Alharbi (2021) reported that applications with interactive and adaptive features enhanced user engagement and learning outcomes. Similarly, Rasinski et al. (2022) indicated that fluency tools that allowed repeated reading and self-assessment improved reading accuracy and expression. Since the "Sound Check" app operated offline, its functionality depended on efficient local data processing and reliable audio recording features, which had been shown to be effective in similar offline educational tools (Nguyen & Do, 2021).

Impact to the Society

The societal impact of educational technology had been widely discussed in literacy research. Offline applications, in particular, played a crucial role in bridging the digital divide by providing access to learning resources in areas with limited internet connectivity. UNESCO (2021) reported that offline educational tools contributed to inclusive education by reaching learners in remote or under-resourced communities. Kim and Park (2022) found that reading fluency applications increased learners' motivation and confidence, especially when used in blended or remote learning environments. The "Sound Check" app, being offline and laptop-based, had the potential to support literacy development in schools with limited technological infrastructure, thereby contributing to educational equity and social development.

Security of User's Data

Security of user data had been a major concern in educational technology, even for offline applications. Although offline systems reduced exposure to online threats, they still required secure local storage and encryption to protect user information. Alotaibi (2020) emphasized that user trust depended on transparent data handling and privacy protection measures. Li and Zhao (2023) found that applications with clear data management protocols and user consent mechanisms achieved higher acceptability ratings. For the "Sound Check" app, ensuring that recorded audio files and performance data were securely stored on local devices would have been essential to maintaining user confidence and compliance with data protection standards.

Stability

Stability referred to the reliability and consistency of an application's performance. Stable applications minimized technical errors, crashes, and data loss, which were critical for maintaining user satisfaction. Nguyen and Do (2021) found that system stability significantly influenced user engagement and perceived usefulness in educational software. Offline applications, such as the "Sound Check" app, relied heavily on hardware compatibility and efficient coding to ensure smooth operation without internet dependency. Studies by Chen and Tsai (2023) demonstrated that stable offline learning tools improved user retention and learning continuity, as they allowed uninterrupted practice sessions and reliable data saving.

User-Friendly Interface

A user-friendly interface had been consistently identified as a key factor in technology acceptance. Davis and Venkatesh (2020) stated that perceived ease of use directly affected users' willingness to adopt new technologies. Lin and Chang (2024) found that intuitive design, clear navigation, and accessible visual elements enhanced user satisfaction and learning outcomes. For offline, laptop-based applications like "Sound Check," a simple and organized interface was particularly important for young learners and educators with varying levels of digital literacy. Studies showed that applications with minimalistic layouts and clear instructions facilitated smoother user experiences and higher acceptability (Alqahtani & Alharbi, 2021).

Moreover, the review of related studies and literature indicated that the level of acceptability of the "Sound Check" app for enhancing oral reading fluency depended on multiple interrelated factors. Functionality ensured that the app effectively supported reading practice; societal impact reflected its contribution to literacy accessibility; data security maintained user trust; stability guaranteed consistent performance; and a user-friendly interface promoted ease of use. Offline, laptop-based educational applications had been shown to be effective and acceptable when they addressed these indicators comprehensively. The "Sound Check" app, by aligning with these principles, had the potential to become a valuable tool for improving oral reading fluency in diverse educational settings.

Technology Integration in Reading Instruction

This study examined the reading fluency in second language learning through the use of reading software. In the Philippines, most programs emphasized early-grade remediation, leaving secondary students with undiagnosed fluency deficits that hinder comprehension. Philippine Star (2010) as cited by Tomas et al. (2021) stated that the undeniable fact remains that majority of Filipino students do not possess the ability and motivation to read. Due to the fast-evolving world and changing technology, it cannot be denied that sometimes reading is taken for granted.

Strategic technology integration, supported by learner-centered approaches and leadership endorsement, had significant potential to enhanced educational outcomes (Aljehani, 2024). The integration of Information Communication Technology (ICT) in reading instruction had been shown to have a significant positive impact on students' reading skills such as letter identification, phonics, and oral reading fluency. For instance, reading performance, including areas like letter sound knowledge, familiar word reading, and oral reading comprehension. This suggests that technology can be an effective intervention to enhance reading abilities (Garan & Cubillas, 2024).

Therefore, Sound Check reading app, had been developed to focused on a fundamental skill in education. According to Esteban, et al. (2024), reading literacy has been a challenge in the Philippines based on recent large-scale literacy assessment in two consecutive years. This may be a result of a mismatch between reading instruction and the interest and motivation of students as 21st century learners in improving their reading skills. However, the integration of technology into reading instruction had demonstrated measurable benefits for literacy development across diverse educational contexts. Systematic reviews indicated that

digital technology interventions enhanced student engagement, reading comprehension, and critical reading skills when thoughtfully embedded in curriculum design and teaching practice.

The advancement of information and communication technologies had catalyzed the development of computer-assisted pronunciation training (CAPT) as an active research domain with evolving focal points. To facilitate a comprehensive understanding of how technology has been employed to aid in the teaching and learning of pronunciation, as well as to identify pressing research issues in this domain (Mohsen, 2025). Furthermore, with the rapid advancement of technology, educational institutions are increasingly integrating these tools into their teaching practices (Kumari, 2025).

Educational technology provided the students the chance to learn online or offline and developed independent learning and that was what a recently developed Sound Check app offered services. The availability of digital learning materials was an attempt to realize exactly a widespread learning strategy as cited from Asdam, et al. (2024). Additionally, DepEd Tagbilaran (2024) emphasized inclusive digital education in its Division Memorandum no. 88, underscoring the importance of learners' well-being alongside academic development. Accordingly, the development of the Sound Check Reading App aligned with these guidelines, particularly the Learning Resource Management and Development System (LRMDS) technical evaluation standards, ensuring usability and effectiveness.

Digital Tools and Assistive Applications

By using the developed Sound Check App as assistive technology interventions had demonstrated sustained improvements in reading ability among learners with difficulties. Abellana & Nueva (2025) determined the significant difference in the reading accuracy level of the students before and after exposure to Fluency Development Approach like modeling fluency reading, assisted reading, repeated reading, word study, performance reading, and home and school involvement. For example, the Microsoft Teams (MT) introduced AI-powered toolkit known as "Reading Progress", which aims to aid teachers in improving students' reading skills (Al-Bogami, et al., 2025). In fact, the AI revolution has ushered in major changes in education, reshaping the landscape of learning.

Similarly, digital game-based learning has proven effective in enhancing vocabulary knowledge and promoting self-regulated learning (SRL) strategies (Zhang, et al. (2024). In addition, the study highlighted the effectiveness of Reading Progress in capturing fluency data and promoting self-paced improvement. On the other hand, Othman & Said designed a mobile app based on ADDIE instructional design. Through its mobile-based structure, the developed application delivered teacher's extensive tools to deliver differentiated reading comprehension. However, limitations such as the short duration, localized sample, and constraints of accent recognition in AI-based speech analysis affect the generalizability and validity of results. The findings support the pedagogical integration of AI tools in EFL instruction while calling for future research with larger samples, extended timelines, and diversified digital tools to further validate and expand on these results (Thuan, et al.,2025). One typical application of AI in digital language education is the automatic scoring application that provides feedback on pronunciation repeat outcomes (Fu et al., 2020). Real-time feedback enabling students to fix mistakes faster than conventional lessons ever could (Tahsin & Nabila, 2025).

As stated by Bokindo, et al. (2024), technological advancements have introduced diverse approaches to oral reading instruction, each demonstrating unique benefits. Computer-Assisted Language Instruction (CALI) plays a vital role in teaching English as a Second Language, with research indicating a significant positive relationship between CALI integration and the enhancement of English oral skills. But, Sabri et al. (2024) cited that the study also addresses the challenges and barriers educators face when incorporating technology into their teaching, such as the digital divide distractions and over-reliance on technology.

Nevertheless, Artificial Intelligence (AI) technology, specifically AI-driven speech recognition tools, has been shown to bolster foundational literacy development and improve reading achievement (Bachiri, et al. 2024). The qualitative analysis revealed positive perceptions of the AI-powered Reading Progress tool, noting benefits like increased confidence, gaining new vocabulary, and improved speaking skills (Jose, 2025).

Subsequently, it showed that technology could worked as a reading partner in improving reading skills, especially fluency, and it highlighted that the design of the 'Sound Check' as reading intervention matters for efficacy. Not just that, Sound Check app included a component where technology acted more as a reading partner by offering interactive, adaptive feedback – as opposed to just static content, incorporated long term follow-up to see progress of reading gains. In addition, (Chavez & Palaoag, 2025) demonstrated that integrating well-designed educational technology can significantly enhance student engagement and personalization, improving educational outcomes. The study also underscored the importance of addressing ethical considerations, such as data privacy and algorithmic bias, to ensure that AI-driven educational tools were inclusive and fair.

Audio-Based Learning in Reading Development

The Sound Check app was an Audio-assisted reading, where learners listened to fluent models while reading along, offered promising strategy to enhance fluency, particularly for second-language learners. Then, this approach supports decoding, phrasing, and pacing, which were essential for comprehension (Meggiato et al., 2025). Recent developments in AI-based assessment methodologies also provide solutions to diagnostic challenges in oral reading fluency (van der Velde et al., 2025). Hence, the paramountcy of intelligent tutoring systems, which serve to democratize access to tutoring (Alam et al. 2023).

Moreover, Villorejo (2025), affirmed that interactive software has significant impact and helps improve learners' oral reading performance. Diallo (2023), said that technology has a great role and impact on students reading. And Plata et al. (2024) concluded that within this context, the curriculum, the instructional materials, the reading programs, and the support systems for implementing all these (e.g., technologies suited to what is in the curriculum) must complement each other. (Acenas, 2025) Audio-assisted reading allows students to experience interactive feedback and build fluency through auditory input.

Eventually, audio-based learning helped students understand complex ideas more easily and exposed them to vocabulary and language structures beyond everyday conversation. This fosters deeper comprehension and supports independent reading development (Lhamo & Sakulwongs, 2023).

Text-to-Speech and Speech-to-Text app

The Sound Check app where sounds, voice play, audio recordings, text-to-speech and speech-to-text feedback served as partner to the learners in reading as model, it helped built oral reading fluency. Thus, Text-to-speech (TTS) and speech-to-text (STT) technologies had proven effective in building oral reading fluency. Repeated reading interventions, particularly those conducted one-on-one with fluent models, significantly improve accuracy and comprehension (Hudson et al., 2020).

Similarly, audio-assisted tools such as digital pens have been shown to enhance fluency, vocabulary, and learner engagement (Krish, 2020). Moreover, the eye-gaze patterns of the participants in the experimental group reveal that the synchronization of the visual- and auditory attention in reading-while-listening-based perceptual training is vital for the intervention efficacy (Yang et al., 2023). Additionally, automatic Speech Recognition (ASR) technologies, which convert speech into text, further support fluency development by detecting errors and providing corrective feedback (Bhagat et al., 2024). TTS software has also been widely used as a compensatory tool, improving reading speed, fluency, and self-efficacy among learners with reading difficulties (Raffoul et al., 2023). Finally, along with the statement above that audiobook, when integrated into classroom and non-classroom settings, have demonstrated positive impacts on fluency and comprehension, reinforcing the importance of audio-based interventions (Damra et al., 2025)

Synthesis. The reviewed studies consistently shown that oral reading fluency was a multidimensional construct that extends beyond mere reading speed. Foundational and contemporary studies describe fluency in terms of accuracy**,** rate or automaticity**,** and prosody**,** with phrasing commonly treated as a major feature of prosodic reading and pronunciation often reflected in word-reading accuracy.

Research further indicated that these dimensions were significantly related to comprehension and overall reading competence across grade levels, including secondary and second-language contexts. Thus, the present study's focused on accuracy, phrasing, pronunciation, and speed was well supported by the literature, as these components captured the essential elements of fluent oral reading and meaningful text processing.

Consequently, the reviewed studies and literature collectively emphasized that oral reading fluency (ORF) served as a vital bridge between word recognition and reading comprehension, particularly among secondary English as a Second Language (ESL) learners. Despite its importance, ORF had often been neglected in traditional reading programs, resulting in persistent fluency gaps among learners. Research consistently identified accuracy, phrasing, pronunciation, and rate as the core components of fluency, each contributed uniquely to reading proficiency. Studies revealed that deficiencies in these areas—especially in pronunciation and automaticity—were common among multilingual learners, underscoring the need for targeted interventions and systematic fluency instruction.

Moreover, the integration of technology, particularly through tools like the offline, laptop-based "Sound Check" app, addressed these instructional gaps by providing interactive, adaptive, and accessible reading practice. Literature on educational technology highlighted that the app's acceptability depended on its functionality, societal impact, data security, stability, and user-friendly interface. When these factors were effectively integrated, technology-based reading interventions demonstrated measurable improvements in learners' fluency, motivation, and confidence.

Overall, the reviewed studies supported the use of audio-assisted and AI-powered tools, such as text-to-speech and speech-to-text systems, in enhancing reading accuracy, pronunciation, and comprehension. These innovations allowed learners to received real-time feedback and engage in self-paced practice, fostering independent learning. Overall, the synthesis indicated that the "Sound Check" app aligned with global trends in literacy technology, offering a pedagogically sound and accessible solution to improve oral reading fluency among secondary learners.

Theoretical and Conceptual Framework

This study anchored on the technology and language theory. Highlighted the *ADDIE* model with integration of transformative potential of technology in literacy education or in language learning. According to Huang, et al. (2021), the integration of digital reading tools improves learners' reading motivation and comprehension when aligned with pedagogical strategies. In addition, the framework positions the ADDIE Model as the guiding structure, while emphasizing Language and Technology as the primary construct.

The first box contained *Pre-reading Assessment* stage was considered as the goal setting stage wherein the researcher had to ensure that the solution to the problem on learner's oral reading fluency particularly to the four components: Accuracy; Phrasing; Pronunciation; and Rate/Speed should be assessed. Next, the second box comprised *Intervention* stage where the developed Sound Check app as specifically addressed the needs and with its characteristics like efficiency, functionality, friendly user interface, stability and engaging learning. In this case, the researcher sorted to an offline design but stand-alone model of the app encompassed technology-based instruction presented and used in teaching reading. Here, it would test the efficiency and effectiveness of the developed sound check app if this was meeting the targeted goal. Lastly, the third box covered *Post-reading Assessment* stage as the last phase in which the developed Sound Check reading app would be subjected to final testing through conducting an actual reading. Evaluated its effectiveness to the students oral reading fluency. Generally, this paradigm demonstrated the study's logical structure, highlighted how the pre-reading, intervention, and post-reading stages used to evaluate the impact of "Sound Check" a reading electronic-based instruction for student's independent reading with fluency.

Statement of the Problem

This study sought to develop an "SOUND CHECK APP" for oral reading fluency in enhancing the reading skills of High School Students.

Specifically, it aimed to answer the following questions:

1. What is the level of student's reading fluency before and after the use of Sound Check App as to:
   1.1. accuracy;

1.2. phrasing;
1.3. pronunciation; and
1.4. rate/speed?
2. What reading App can be designed and developed?
3. How is Sound Check implemented in the English language classroom?
4. Is there a significant improvement on the student's reading fluency before and after the implementation of Sound Check App?
5. What is the level of Acceptability of the developed Sound Check App in terms of:
5.1. Functionality;
5.2. Impact to the Society;
5.3. Security of User's Data;
5.4. Stability; and
5.5. User-friendly interface?
6. What improvement/enhancement can be recommended based on the evaluation result?

Scope and Limitations of the Study

For uniformity of understanding the contents and findings, the study limited along the following aspects:

Focus. This study focused on the development of "Sound Check App" for oral reading fluency in enhancing reading skills of Grade 7 learners at Socorro National High School.

Participants. The participants of the study were the forty (40) identified Grade 7 students who are *ARAL-Reading* (Academic Recovery and Accessible Learning-Reading) Tutees of Socorro National High School, Socorro, Surigao del Norte. The participants were randomly selected from six different classes.

Place and Time. The study conducted in the Computer Laboratory of Socorro National High School to easily managed the participants per reading session during fourth quarter of the Academic Year 2025–2026. They would lend one hour per day of their time every afternoon exactly 4:00 to 5:00 p.m. for fifteen (15) days during the participation on the research study. The schedule was following on the ARAL-Reading class hour.

METHODS

Research Design

This study adopted a one-group quasi-experimental research design employed quantitative methods to evaluate the level of acceptability of the "Sound Check" app as an e-based approach in oral reading fluency among Grade 7 learners. This design was appropriate in determining effectiveness of the developed reading application through experimental conditions.

In this setup, the participants grouped as one: The Experimental Group. This group received technologically based reading materials using the developed "Apple Sound Check" app, wherein selected English Poems, Short Stories, Tongue Twisters and Short Passages compiled to be entered in the system but still with the quality assurance by the Master Teacher/s and EPS-LR specifically chosen and designed to reinforce good reading.

The group underwent the sequence of reading processes and lessons—covering phonetics, word sounding, poem recital, reading and with pre-reading and follow up post-reading assessment to check progress over fifteen consecutive days within a quarter.

A pre-reading administered to determine their baseline frustration level and/or reading competency. Followed the instructional period, a post-reading assessment conducted to measure learning gains and evaluated the effectiveness of the Apple Sound Check as reading partner an e-based method.

This experimental design allowed the researcher to observed differences in pre-reading and post-reading performance and to attribute any significant improvements to the intervention. It also ensured control over external variables that might affect learning, thereby increasing the reliability and validity of the study's findings.

Research Environment

This study conducted at Socorro National High School (SONHS), located in Barangay Taruc, Municipality of Socorro, Surigao del Norte. The school partly located in municipal proper, situated along hillside and mountainous terrain. SONHS was the second biggest school in Siargao Division, the Pilot implementer of MATATAG Curriculum in Junior High School (Grades 7 to 10) entire the Schools Division, and one of the PISA (Program for International Students Assessment) participants in CARAGA Region last year 2025 as conducted.

The school had internet access from DICT Free Wi-Fi program, but with inadequate access due to a number of users, the reason for limited full digital integration. However, the strong partnership between teachers, parents, and the local community helped sustain educational programs and improved learner outcomes. Teachers were also aiming for standard education.

Overall, Socorro National High School provided a nurturing academic results and values-driven learning environment. Given its openness to innovation, community support, and commitment to learner engagement made it an ideal setting for implementing the "Apple Sound Check" reading app, an offline e-based approach to oral reading with fluency, particularly among struggling Grade 7 learners.

Participants

The participants of this study were the 'ARAL-Reading Program' Tutees from Grade 7 class at Socorro National High School with a total of forty (40) participants as identified. This study utilized both Purposive Sampling Technique and Stratified Sampling Technique to identify and select the participants effectively. These learners were purposefully chosen based on their readiness and appropriateness for the intervention, particularly as they were in the crucial stage of transitioning from elementary school, where a stronger foundation in word recognition and vocabulary build up were essential for academic success. A group of evaluators, the

English Education Program-Learning Resource Personnel, Master Teachers, and Information Technology Experts. Another group of evaluators were the eighteen (18) Grade 7 Tutor Teachers, composed of 1 Male and 17 Female. The selection of participants ensured comparability across learners in same grade level and reading readiness that allowed the researcher to investigate the effectiveness of the Apple Sound Check as reading partner across learners with struggling levels of pronunciation and fluency in oral reading. Their inclusion in the study was crucial for measuring both baseline competencies and learning gains after the intervention.

For the Grade 7 ARAL-Reading Tutees, they reached a population of 137 learners composed of 83 Males (60.58%) and 54 females (39.42%) of the entire seven different sections. But a total of 40 participants only participated in the study which composed of 20 males (14.60) and 20 females (14.60) respectively. For the Tutor Teachers, a total of 18 respondents participated, consisting of 1 male (5.56%) and 17 females (94.44%). Majority of the Teacher participants were female, indicated a higher female participation.

Research Instrument

The study utilized comprehensive sets of reading selections from Phil-IRI as Pre-reading and post-reading test instruments to evaluate the level of acceptability of the 'Sound Check' reading app an electronic-based learning among secondary learners.

Central to the study was the developed 'Sound Check' electronic-based offline application solely developed by an IT Expert, which served as the primary instructional material for the experimental group. This software focused on reading performance in accuracy, phrasing, pronunciation, and reading speed that covered fluency with reading texts as content adapted from the Phil-IRI full package and manual.

Each reading material was carefully crafted to integrate reading components, allowing learners to intuitively internalize each word correct pronunciation. This Sound Check App was the electronic reading material features a Speech-to-Text and Text-to-Speech process that allowed auto-correct error after the utterances, and created a dynamic and low-anxiety learning environment that enhanced both memory retention and student motivation.

Accompanied on these electronic-based reading lessons were compilation of selected works from Phil-IRI materials, pre and post-reading assessment, the lesson plans which keep the learning objectives met, the reading rubrics to stay guided and with performance-based output, and evaluation tools for the expert to assessed the developed Apple Sound Check reading app – these instruments developed by the researcher to guide the instructional delivery. The compilation of poetries, short stories, tongue twisters, and short reading passages outline with the learning competencies, objectives, content coverage, teaching strategies, and assessment methods, ensuring a structure and consistent approach to reading instruction.

To assess learning outcomes, two different sets of a 5-pieces reading selections administered as both a pre-reading and a post-reading to measure the learners' reading performance level before and after the use of the app. This meant that every reading assessment had its own set of pre-reading and post-reading assessments with the use of the developed "Sound Check" app to track incremental reading progress for 15 consecutive days within in a fourth quarter. The fluency levels of the participants, as to reflected in their scores on these assessments, evaluate using a set of established parameters as reflected in the Table 5. These classification parameters provided a structured framework for interpreting learners' oral reading fluency levels and gauging the acceptability of each lesson within the overall instructional intervention that showed in reading app's Analytical Dashboard.

On the other hand, an evaluation tool used by the experts to assess the Level of Acceptability of the developed apple sound check app. It contained five parts wherein each part had five indicators. The first part contained the Level of Acceptability in terms of Functionality. The second part contained the Level of Acceptability in terms of User-friendly interface. The third part contained the Level of Acceptability in terms of Security of User's Data. The fourth part contained the Level of Acceptability in terms of Impact to the Society. Lastly, the fifth part contained the Level of Acceptability in terms of Stability.

Ethics and Data Gathering Procedure

To ensure that data collection was ethically sound and methodologically rigorous, the researcher followed a structured set of procedures prior to, during, and after the implementation of the study.

The process begun with the preparation of the research instruments, which included the Lesson Plans, T.O.S., Test Questionnaire, Rubrics, researcher-designed electronic-based reading application the "Apple Sound Check", which was sensibly developed by the IT expert, and the 10-pieces reading literary texts that assess reading fluency: pre-reading and post-reading assessment. These reading materials anchor on the compilation from Phil-IRI valid literature source compendium.

Followed the development of the research instruments, the researcher asked permission for the conduct of the study and administration of the research instruments were sent to the School Principal of the above-mentioned school within her jurisdiction, examining the extent of Apple Sound Check reading app so that learners were ensured they would benefit and would serve its purpose. Prior to it, was the submission of a formal request letter to the following; Schools Division Superintendent of Siargao, District Supervisor of Socorro East District, and the School Principal of Socorro National High School to sought permission to conduct the research. Once permission was granted, English Master Teachers of Socorro National High School, Socorro East District, conducted a Quality Assurance review of the electronic-based literary pieces to ensure that the instructional materials were pedagogically sound, developmentally appropriate, and aligned with curriculum standards.

After the approval and quality assurance clearance were secured, the researcher conducted an orientation session with the learners, clearly explained the purpose of the study, the learning procedures, and how their data would be used, ensuring informed consent and voluntary participation. Learners were assured of confidentiality and anonymity, and that their participation would have no impact on their academic standing.

Once the participants understood the process, the pre-test administered to assessed their baseline word recognition competence. Followed the reading app deployment for pre-reading, the intervention phase begun with reading lessons using the developed "Sound Check" application an e-based approach. The reading assessments covered for two days.

The full intervention periods last fifteen (15) days included the during session. At the end of reading interventions, a post-reading consisting of 5-piece literary texts administered to assess learner's oral reading fluency of the texts read.

All assessment literary texts as responses were subject for record/collect systematically and organized for evaluation. Upon completion of the implementation phase, the researcher compiled, encoded, and analyzed the data with the help of the statistician using appropriate statistical tools to determine the effectiveness of Apple Sound Check reading application an offline e-based approach in enhancing the reading fluency of secondary learners.

Indeed, all procedures carried out in the study do strictly adhere to ethical standards in educational research.

Data Analysis

To analyze the data gathered, the following statistical tools were applied to answer the problems of the study:

Mean and Standard Deviation. These employed to determine the level of word recognition and reading fluency of Grade 7 learners as reflected in their pre-reading and post-reading remarks. This statistical tool helped measure the central tendency (average performance) and the variability (distribution or spread of scores) among learners, providing insight into their general performance and consistency. Furthermore, it used to evaluate the efficiency, friendly user application, and learning engagement of Apple Sound Check application, an e-based approach in reading by comparing learners' level results with clearly defined parameters for reading fluency levels.

Shapiro-Wilk. This utilized to determine normality test whether there was a significant comparison in learners' reading fluency before and after the intervention. Specifically, it compared the pre-test and post-test scores of the same group of learners (within the experimental group) to assessed whether Apple Sound Check reading app leads to statistically significant improvements in reading fluency. The test helped established the effectiveness of the intervention by identifying measurable gains over time.

Wilcoxon Signed-Rank Test. This utilized to indicate a statistically difference between the pre– and post-reading assessments of students' performance if they significantly improved after the intervention.

RESULTS AND DISCUSSIONS

Performance level of the participants in the oral reading fluency before and after the implementation of the Apple Sound Check Reading App

The Table 1 presented the performance level of the student's oral reading fluency before and after the use of Sound Check App as to: accuracy, phrasing, pronunciation, and rate/speed.

Table 1

Level of student's reading fluency before and after the use of Apple Sound Check Reading App

Indicators	Before-Mean	SD	Description	After-Mean	SD	Description
Accuracy	1.00	0.00	Poor	2.00	0.41	Beginning
Phrasing	2.82	0.55	Developing	3.20	0.40	Developing
Pronunciation	1.04	0.20	Poor	2.04	0.56	Beginning
Rate/Speed	2.42	1.10	Beginning	4.70	0.68	Highly Fluent

The results indicated a clear improvement in students' reading performance from the pre-reading to the post-reading assessment. As shown below, each component was comprehensively discussed.

The students' pre-test mean score in accuracy was **1.00 (SD = 0.00)**, described as *Poor*. This uniform low performance indicates that before using the Apple Sound Check App, students struggled significantly with reading words correctly. After the intervention, the mean score rose to **2.00 (SD = 0.41)**, described as *Beginning*. This improvement suggests that the app helped students become more aware of their reading errors and supported the development of word recognition skills. Recent studies highlighted that teacher knowledge and technology-based interventions can strengthen foundational literacy skills (Hudson et al., 2021).

In terms of phrasing, the pre-test mean was **2.82 (SD = 0.55)**, described as *Developing*. This indicates that students already had some ability to group words into meaningful phrases, though inconsistently. After using the app, the mean increased to **3.20 (SD = 0.40)**, still within the *Developing* category. While the descriptive level did not change, the improvement in mean score and reduced variability suggest more consistent phrasing. Research confirms that text reading fluency is multidimensional, involving accuracy, speed, and prosody, and that improvements in phrasing contribute to comprehension (Kim, Quinn, & Petscher, 2021).

The pre-test mean score for pronunciation was **1.04 (SD = 0.20)**, described as *Poor*. After the intervention, the mean increased to **2.04 (SD = 0.56)**, described as *Beginning*. This improvement shows that the app helped students' progress from poor pronunciation to an early stage of correct oral reading. The Apple Sound Check App likely supported this through features such as listening, repeating, and recording oral reading. However, since the post-test level remained at *Beginning*, continuous practice and teacher support are necessary. Aldhanhani and Abu-Ayyash (2021) emphasized that oral reading fluency instruction, including pronunciation practice, is critical for comprehension and should be integrated into reading programs.

The most significant improvement was observed in rate/speed. The pre-test mean was **2.42 (SD = 1.10)**, described as *Beginning*. The high variability indicated inconsistent reading speeds among students. After using the app, the mean score rose dramatically to **4.70 (SD = 0.68)**, described as *Highly Fluent*. This result demonstrates that the app was particularly effective in enhancing reading speed and fluency, while also reducing variability across students. Recent experimental studies confirm that repeated reading methods, especially audio-assisted approaches, significantly improve reading rates and fluency (Pham, Baker, & Nguyen, 2024).

Overall, the results showed that the Sound Check App had a positive impact across all four indicators of reading fluency: accuracy, phrasing, pronunciation, and rate/speed. While improvements in accuracy, phrasing, and pronunciation were modest, the gains in reading rate were substantial, suggesting that technology-based interventions can be particularly effective in building automaticity and fluency. These findings aligned with recent research emphasizing the interconnectedness of accuracy, phrasing, and speed which demonstrated a substantial increase in reading performance, as evidenced by the shift in average scores from *poor* in the pre-assessment to *highly fluent* in the post-assessment.

Table 2. Normality Test of Reading Fluency Scores Before and After the Use of Apple Sound Check App

Indicators	Shapiro-Wilk (before)		Shapiro-Wilk (after)		Interpretation
	W	p-value	W	p-value	
Accuracy	0.934	0.0242	0.9674	0.3124	**Not Normally Distributed**
Phrasing	0.94	0.0379	0.9363	0.0288	**Not Normally Distributed**
Pronunciation	0.9665	0.2915	0.9809	0.7359	**Normally Distributed**
Rate / Speed	0.9775	0.6114	0.9834	0.8221	**Normally Distributed**

Based on the Shapiro-Wilk normality test, accuracy and phrasing were interpreted as not normally distributed because their p-values were below *0.05* in at least one of the before-and-after results. Therefore, the appropriate statistical tool for comparing the before and after scores in these indicators was the Wilcoxon signed-rank test, which used for paired data that were not normally distributed. On the other hand, pronunciation and rate/speed were interpreted as normally distributed because their before and after p-values were greater than *0.05*. Thus, the appropriate statistical tool for these indicators was the paired samples t-test, which is used to compare the before and after scores of the same group when the data are normally distributed.

What reading App can be designed and developed?

As finding a solution to an existing problem faced by the students in reading, it was analyzed first what were the current trends, the type of students' generation and their hobby. That was why Sound Check Reading App had been designed, developed, implemented and evaluated that could enhanced the Oral Reading Fluency of the Grade 7 Struggling Students. Also, it gave them privacy while helping themselves in enhancing oral reading fluency.

As shown in Appendix E, the students logged in on their personal account after they created it. They had private access to the reading app with username and password. In student module, the user could navigate here to practice reading, listened to the speech engine, speak and the same time would hear their own voice while in used of the app because its model was Text-to-Speech (TTS) and Speech-to-Text perfect for enhancing their reading skills. In teacher's module, he/she could navigate here to monitor reader's reading progress and injected reading texts of different categories. Teacher could also change user's password upon the request if its forgotten. The app would automatically analyze the reader's performance, wherein teacher could monitor who among the students needed intervention and who performed well.

How is Sound Check Reading App implemented in the English language classroom?

It begun with the orientation of the participants, conducted pre-reading assessment to measure their level of reading readiness. Followed by the series of lessons covered the vowel sounds and the reading fluency components. Afterwards, the reading implemented through developed Apple Sound Check. Let the participants immersed into self-paced reading and practiced fluency with the app. Lastly, the post-reading assessment applied to evaluate their progress, and measured the learning gains.

The significant improvement on the participant's reading fluency before and after the implementation of Sound Check Reading App

Table 2 presented the significant improvement on the student's reading fluency before and after the implementation of Sound Check Reading App.

Table 2

Improvement on the student's reading fluency before and after the implementation of Sound Check Reading App

Variables Compared (Before-After test)	Test Statistic (W)	p-value	Decision	Interpretation
Accuracy	0.00	< .001	Reject H_0	Significant
Phrasing	43	< .001	Reject H_0	Significant

Note: Test Used is Wilcoxon Signed-Rank Test

The results revealed a statistically significant improvement in students' oral reading fluency after the implementation of Sound Check app across all four components.

As for accuracy, the Wilcoxon Signed-Rank Test revealed a test statistic value of $W = 0.00$ with a *p-value* of $< .001$. Since the p-value was less than the *0.05* level of significance, the null hypothesis (H_0) was rejected. This strongly indicated that there

was a significant improvement in the students' reading accuracy after the implementation of the Sound Check App. The result supported by the descriptive findings, where the students' mean score increased from *1.00*, described as Poor, to *2.00*, described as Beginning. This meant that after using the app, the students became more capable of reading words correctly, although their level of accuracy was still in the early stage of development. The significant result suggested that the Sound Check App helped students practice oral reading and became more aware of their word-reading errors. Recent studies confirmed that technology-based interventions can enhance foundational literacy skills by providing immediate feedback and scaffolding word recognition (Hudson et al., 2021; Oakley, 2024).

As for phrasing, the Wilcoxon Signed-Rank Test showed a test statistic value of $W = 43$ with a *p-value* of $< .001$. Since the p-value was lower than the *0.05* level of significance, the null hypothesis was also rejected. This meant that there was a significant improvement in the students' phrasing after using the Sound Check App. This result was consistent with the descriptive findings, where the mean score increased from *2.82* to *3.20*, although both scores were still described as Developing. This indicated that while the students remained within the same descriptive level, their ability to group words into meaningful phrases improved significantly. The result suggested that the app provided opportunities for students to practice reading with better rhythm, expression, and oral flow. However, continued reading practice and teacher guidance were still needed for students to reach a higher level of fluency. This finding aligned with research emphasizing that fluency was multidimensional—accuracy, speed, and prosody all contribute to comprehension—and that structured practice can strengthen phrasing and oral expression (Kim, Quinn, & Petscher, 2021; Rasinski, 2023).

Overall, the results show that there was a *significant improvement* in the students' reading fluency in terms of accuracy and phrasing after the implementation of the Sound Check App. Since both indicators obtained p-values of $< .001$, the improvements were statistically significant. Therefore, the Sound Check App may be considered an effective tool in enhancing selected aspects of students' oral reading fluency, particularly in helping them read words more accurately and organize words into meaningful phrases during oral reading.

Variables Compared (Before-After test)	t-value	df	p-value	Decision	Interpretation
Pronunciation	23.4926	38	< .001	Reject H_0	Significant
Rate/Speed	13.0299	38	< .001	Reject H_0	Significant

Note: Test Used is Paired t- Test

For pronunciation**,** the paired samples t-test revealed a *t-value* of *23.4926* with 38 degrees of freedom and a *p-value* of $< .001$**.** Since the p-value was lower than the 0.05 level of significance, the null hypothesis (H_0) was rejected. This meant that there was a *significant improvement* in the students' pronunciation after the implementation of the Sound Check App. This result supported by the descriptive findings, where the students' mean score increased from *1.04*, described as *Poor*, to *2.04*, described as *Beginning*. This indicated that after using the app, the students became more capable of pronouncing words correctly during oral reading, although their pronunciation skills were still at the early stage of development. The significant improvement suggested that the Sound Check App provided students with opportunities to practice oral reading, recognize pronunciation errors, and improve their spoken word production, highlighting the need for continued teacher support. This finding supported by Sampang (2021) and Department of Education (2023) underscored that oral reading fluency programs, when combined with technology, can improve pronunciation and spoken word production

For rate/speed, the paired samples t-test showed a *t-value* of *13.0299* with 38 degrees of freedom and a *p-value* of $< .001$. Since the *p-value* is less than the *0.05* level of significance, the null hypothesis was rejected. This indicates that there was a *significant improvement* in the students' reading rate or speed after using the Apple Sound Check App. The descriptive findings also support this result, as the students' mean score increased from *2.42*, described as *Beginning*, to *4.70*, described as *Highly Fluent*. This means that the students were able to read faster and more smoothly after the intervention. Among the reading fluency indicators, rate/speed showed a strong improvement, suggesting that the app was highly effective in helping students build reading automaticity through repeated oral reading practice. This finding highlighted the app's acceptability in building automaticity through repeated oral reading practice. Recent studies confirmed that repeated reading, particularly audio-assisted approaches, significantly boosted reading speed and fluency (Milliner, 2021; Pham, Baker, & Nguyen, 2024; Van Erp, 2021).

Overall, the results shown that both *pronunciation* and *rate/speed* significantly improved after the implementation of the Sound Check App. Since both indicators obtained *p-values* of $< .001$, the improvements were statistically significant. Therefore, the Sound Check App could be considered effective in enhancing students' oral reading fluency, particularly in improving their pronunciation and reading speed. Improvements were statistically significant across all four indicators, with accuracy and phrasing showing steady gains, pronunciation moving from poor to beginning, and rate/speed achieving the most dramatic progress. These findings reinforced the value of integrating technology-based tools into reading instruction, as they provide structured practice, immediate feedback, and opportunities for repeated oral reading—all of which are essential for developing fluent readers.

The level of acceptability of the developed Sound Check App

Table 3 presented the level of acceptability of the developed Sound Check Reading App in terms of: functionality, user-friendly interface, security of user's data, impact to the society, and stability. This was validated by the EPS-LR, IT Experts, Master Teachers, and the ARAL-Tutees that would ensure its validity and assure its quality before the app was deployed. Also, this app was an offline model.

Table 3

Level of Acceptability of the developed Apple Sound Check Reading App

Functionality	Mean	SD	Verbal Description
1. The multimedia presentations have a coherent layout, design and background	4.96	0.21	Strongly Agree
2. Audio is accompanied by a familiar control panel, featuring pause, volume, and voice type (male or female mechanical voice for the user's preferences) control	4.78	0.42	Strongly Agree
3. All spoken sounds are accompanied by a detailed illustrative caption that the user can easily access	4.39	0.50	Strongly Agree
4. The user can control the pace at which he/she moves through the app	4.87	0.34	Strongly Agree
5. All functionality is accessible by the use of the mouse and/or keyboard	4.96	0.21	Strongly Agree
Mean	**4.79**	**0.33**	**Strongly Agree**
User-friendly interface			
1. The design is simple, i.e. not cluttered with irrelevant devices and information	4.96	0.21	Strongly Agree
2. The ways to navigate through the material are clear	4.96	0.21	Strongly Agree
3. Labels, buttons, menus, text, and general layout of the resource are consistent and visually distinct	4.78	0.52	Strongly Agree
4. The user is always made aware of what to do next	4.74	0.45	Strongly Agree
5. The resource provides feedback about the user's responses	4.57	0.51	Strongly Agree
Mean	**4.80**	**0.38**	**Strongly Agree**
Security of User's Data			
1. On-device data processing	4.87	0.34	Strongly Agree
2. Input data entry is constrained	4.52	0.59	Strongly Agree
3. Only collects necessary data	4.87	0.34	Strongly Agree
4. No third-party data sharing without approval	4.83	0.39	Strongly Agree
5. Access to reading app data is protected by device-level security passcodes and username (log-in interface)	4.91	0.29	Strongly Agree
Mean	**4.80**	**0.39**	**Strongly Agree**
Impact to the Society			
1. Contribution to public education	4.83	0.39	Strongly Agree
2. Encouragement of responsible technology use	4.70	0.47	Strongly Agree
3. Improved accessibility and inclusion	4.65	0.49	Strongly Agree
4. Support reader readiness	4.91	0.29	Strongly Agree
5. Positive influence on young learners	4.83	0.39	Strongly Agree
Mean	**4.78**	**0.40**	**Strongly Agree**
Stability			
1. Consistent data recording	4.57	0.59	Strongly Agree
2. Regular software maintenance	3.74	0.86	Agree
3. No internet connection needed to access	4.91	0.29	Strongly Agree
4. zero performance interruption	4.22	0.52	Strongly Agree
5. No system updates	4.17	0.65	Agree
Mean	**4.32**	**0.58**	**Strongly Agree**

Functionality

The results showed that the highest mean scores were obtained by two indicators: "The multimedia presentations have a coherent layout, design and background" and "All functionality is accessible by the use of the mouse and/or keyboard," both with a mean of 4.96 (SD = 0.21), interpreted as *strongly agree*, which meant that *the indicator was highly observed, acceptable, and related to the required standard*. This indicated that respondents rated the application very highly in terms of design quality and accessibility.

On the other hand, the lowest mean score was recorded for "All spoken sounds are accompanied by a detailed illustrative caption that the user can easily access" (M = 4.39, SD = 0.50), which was still interpreted as *strongly agree*, meaning that *the indicator was highly observed, acceptable, and related to the required standard*. Although this aspect received the lowest rating among the indicators, it still reflected a high level of acceptability.

This finding supported by recent literature emphasizing that well-organized multimedia design improved learner engagement and supports more effective learning experiences in digital environments (Stanevičienė et al., 2025; AlShaikh et al., 2024). Likewise,

the very high rating for mouse- and keyboard-based access aligned with current accessibility standards, which state that digital applications should be operable through a keyboard interface and should support accessible interaction across platforms, including mobile and software environments (World Wide Web Consortium [W3C], 2024, 2025). These standards reinforce the importance of ensuring that app functions were easy to access and use, which contributed to the overall acceptability and usability of the application.

On the other hand, the indicator **"All spoken sounds are accompanied by a detailed illustrative caption that the user can easily access"** obtained the lowest mean score (M = 4.39, SD = 0.50), although it was still interpreted as **strongly agree**. This means that caption support remained **highly acceptable**, even if it was rated slightly lower than the other functionality indicators. This result might suggest an area for further improvement, since recent studies shown that captions can enhance comprehension and support learners in processing spoken input more effectively, especially in technology-assisted learning environments (Mahalingappa et al., 2024; Boltiziar & Munkova, 2024). In addition, accessibility guidance continued to emphasize that captions were important because they provide text equivalents for spoken audio, making digital learning materials more inclusive and usable for a wider range of learners (W3C, 2024).

User-friendly interface

The results showed that the highest mean scores were obtained by two indicators: "The design is simple, i.e. not cluttered with irrelevant devices and information" and "The ways to navigate through the material are clear" both with a mean of 4.96 (SD = 0.21), interpreted as *strongly agree*, which means that *the indicator was highly observed, acceptable, and related to the required standard*. This indicates that respondents rated the application very highly in terms of graphical presentations and its usability. This result supported by recent studies showing that overly complex user interface design increases extraneous cognitive load, while a clear and simplified interface helps learners focus on the learning task and improves overall usability in mobile learning applications (Faudzi et al., 2024; Jiang et al., 2024). Likewise, clear and consistent navigation is a key element of user-friendly digital systems because it helps users find content easily, determine where they are in the application, and interact with learning materials more efficiently (World Wide Web Consortium [W3C], 2024; Abdoli eta al., 2025). Recent research on digital learning platforms also emphasizes that UI/UX features strongly influence learner satisfaction, engagement, and the effective use of educational applications (Syamala et al., 2025)

On the other hand, the lowest mean score was recorded for "The resource provides feedback about the user's responses" (M = 4.57, SD = 0.51), which was still interpreted as *strongly agree*, meaning that *the indicator was highly observed, acceptable, and related to the required standard*. Although this aspect received the lowest rating among the indicators, it still reflected a high level of acceptability. This finding might suggest that feedback mechanisms in the app are present and useful, but still have room for enhancement. Recent literature supports the importance of timely and usable feedback in digital learning environments, noting that feedback functions improve interaction, user satisfaction, and continued intention to use learning technologies (Žerovnik, 2024; Yu & Cai, 2022). In addition, current accessibility guidance highlights that digital systems should help users avoid and correct mistakes by providing appropriate labels, instructions, and error identification, which are essential features of a user-friendly interface (W3C, 2024). Thus, while the feedback feature strengthening this aspect may still improve the application's overall usability and instructional value.

Security of User's Data

The results showed that the highest mean score was obtained by one indicator: "Access to reading app data is protected by device-level security passcodes and username (log-in interface)" with a mean of 4.91 (SD = 0.29), interpreted as *strongly agree*, followed by another two high indicators: "On-device data processing" and "Only collects necessary data" with a mean of 4.87 (SD = 0.34), still interpreted as *strongly agree*, which meant that *the indicator was highly observed, acceptable, and related to the required standard*. This indicated that respondents rated the application very highly in terms of user privacy and data protection. This was consistent with current security and privacy guidance, which emphasized that authentication controls are essential in protecting systems and user data from unauthorized access (NIST, 2025). The strong rating for on-device data processing was also supported by recent work in mobile educational networks showing that keeping sensitive student data on the user's device, rather than centralizing raw data, strengthens privacy protection and reduces exposure to breaches (Qiang & Liu, 2026). Likewise, the high acceptability of collecting only necessary data aligns with the principle of data minimization, which requires systems to process only data that are relevant and necessary for their intended purpose (national Privacy Commission [NPC], 2024; NIST, 2025). Together, these findings suggested that the developed reading app reflected recognized privacy-preserving practices in educational technology.

On the other hand, the lowest mean score was recorded for "Input data entry is constrained" (M = 4.52, SD = 0.59), which was still interpreted as *strongly agree*, meaning that *the indicator is highly observed, acceptable, and related to the required standard*. Although this aspect received the lowest rating among the indicators, it still reflected a high level of acceptability. The result still supported the app's overall security because constraining input was a recognized secure software practice that helps reduce vulnerabilities caused by invalid, excessive, or malicious user entries. NIST's Secure Software Development Framework specifically recommends validating all inputs as part of secure coding practices to reduce software vulnerabilities (NIST, 2022). Thus, while this aspect received the lowest score among the security indicators. Its strong rating still suggests that the application was viewed as adequately protective of user data, with potential room for further refinement in input controls and validation mechanisms.

Impact to the Society

The results showed that the highest mean score was obtained by one indicator: "Support reader readiness" with a mean of 4.91 (SD = 0.29), interpreted as *strongly agree*, followed by another two high indicators: "Contribution to the Public Education" and "Positive influence on young learners" with a mean of 4.83 (SD = 0.39), still interpreted as *strongly agree*, which meant that *the indicator was highly observed, acceptable, and related to the required standard*. This indicated that respondents perceived the application as having a highly positive educational impact. This result was supported by recent literature showing that high-quality educational apps could strengthen literacy-related competencies and helped prepare learners for school success. Niklas et al. (2025)

found that learning apps may increase children's literacy competencies and help prepare them for school, while Liu et al. (2024) concluded in their systematic review that digital technologies can promote young children's language and literacy development when used in developmentally appropriate ways. In a broader education context, Forsström et al. of the OECD (2025) also reported that digital technologies in primary and secondary education hold strong potential to enhance teaching and learning processes, foster student engagement, and support self-regulated learning. These studies substantiate the very high ratings given to the reading app in terms of supporting reader readiness and contributing positively to educational outcomes.

Furthermore, the strong rating for **"Positive influence on young learners"** was likewise supported by current evidence. Schiele et al. (2025) found that specifically designed literacy apps can support young children from diverse backgrounds in acquiring early literacy skills, suggesting that educational apps can positively influence learners across different contexts. This supports the present finding that the developed reading app was perceived as beneficial to learners, especially as an intervention intended to improve reading performance.

On the other hand, the lowest mean score was recorded for "Improved accessibility and inclusion" (M = 4.65, SD = 0.49), which is still interpreted as *strongly agree*, meaning that *the indicator is highly observed, acceptable, and related to the required standard*. Although this aspect received the lowest rating among the indicators, it still reflected a high level of acceptability. This finding remains consistent with recent research showing that educational technologies can help create more inclusive and accessible learning environments by personalizing instruction, removing barriers to participation, and supporting equitable learning opportunities for students with diverse needs (Navas-Bonilla et al., 2025). In the same vein, UNESCO's strategy on technological innovation in education emphasizes that technology should be used in human-centered, equitable, and inclusive ways to strengthen education as a public good (UNESCO, 2021). Thus, although accessibility and inclusion received the lowest mean among the impact indicators, the result still reflects a strong level of acceptability and suggests that the app contributes positively to inclusive educational practice.

Stability

The results showed that the highest mean score was obtained by only one indicator: "No internet connection needed to access" with a mean of 4.91 (SD = 0.29), interpreted as *strongly agree*, followed by another high indicator: "Consistent data recording" with a mean of 4.57 (SD = 0.59), still interpreted as *strongly agree*, which meant that *the indicator was highly observed, acceptable, and related to the required standard*. This indicated that respondents rated the application very highly in terms of software design and steadiness. This result is supported by recent literature emphasizing that offline access is an important stability-related feature because many learners do not always have reliable internet connectivity, and learning materials that depend entirely on online access may become difficult or impossible to use in such contexts (Ferguson et al., 2024; UNESCO, 2023). In this sense, the app's ability to function without internet connection strengthens its practical reliability and continuity of use. Likewise, consistent data recording reflects information quality and system dependability, both of which are important to learner satisfaction and effective use of educational technologies (Alterkait & Alduaij, 2024; Nguyen et al., 2025). These studies support the finding that the developed reading app was perceived as stable and dependable for instructional use.

On the other hand, the lowest mean score was recorded for "Regular software maintenance" (M = 3.74, SD = 0.86), which was interpreted as *agree*, meaning that *the indicator was moderately observed, acceptable, and related to the required standard*. Although this aspect received the lowest rating among the indicators, at least it reflected a level of acceptability. This might suggest that the application was generally stable in actual use, but respondents saw room for improvement in terms of updates, maintenance routines, and long-term support. Recent research on mobile applications highlighted that reliability, supportability, and maintenance remain essential non-functional requirements because users tend to value systems that continue to perform consistently over time and are improved through ongoing refinement (Wimalasooriya et al., 2022; Ghabban & Ghaban, 2025). In addition, research on accessibility and agile development argues that quality attributes such as accessibility and maintainability should be treated as built-in parts of the development process rather than as post-development additions, since this leads to more reliable and ethically designed digital products (Khan, 2025). Thus, while regular software maintenance received the lowest mean among the stability indicators, the result still supports the overall acceptability of the app and points to software maintenance as an important area for future enhancement.

Generally, the developed app as being validated were meeting the standards as learning opportunity and should be adopted by teachers and applied for it was an innovation to reading, as concluded by Khan (2025) that accessibility should not be treated as a post-development feature but as a foundational component of agile processes. By giving voice to practitioners, this research underscores the value of empathy, structure, and advocacy in building accessible digital experiences. Though this lens, accessibility becomes a catalyst not only for better products but for more ethical, inclusive design cultures.

What improvement/enhancement can be recommended based on the evaluation result?

Based on the evaluation result, it was recommended that the Apple Sound Check App be further enhanced by improving its stability features, particularly in software maintenance, system updates, and uninterrupted performance. Although the application demonstrated a high level of acceptability, the relatively lower rating for regular software maintenance suggests the need for continuous refinement and updating of the system. Regular maintenance and software updates are essential to ensure reliability, prevent system failure, and maintain long-term usability of educational applications (Wimalasooriya et al., 2022; Ghabban & Ghaban, 2025). Furthermore, ongoing technical support and system optimization contribute to improved system efficiency and user satisfaction, particularly in educational environments where consistent performance is required for instructional continuity (Alenezi, 2023).

Additional options for AI-generated voice that must aligned with the Filipino accent, and highlighted the read words. These enhancements were expected to further increase the app's effectiveness, usability, and sustainability as an instructional tool for oral reading fluency in the English language classroom. In addition, the integration of **AI-generated voice features aligned with the Filipino accent** is recommended to improve learners' pronunciation accuracy and comprehension. Research has shown that speech-based technologies that reflect learners' linguistic context can enhance pronunciation skills and listening comprehension by

providing culturally and linguistically relevant models (Liu et al., 2023; Kohnke & Moorhouse, 2022). Incorporating localized accents in speech synthesis has also been found to increase learner engagement and improve familiarity with language sounds, particularly among English language learners in multilingual settings (Rahman et al., 2024). This supports the recommendation to align AI-generated voices with the Filipino accent to strengthen the effectiveness of the reading application in promoting oral reading fluency.

Another recommended enhancement is the inclusion of **word-highlighting features** that visually track spoken or read words during reading activities. Visual cues such as word highlighting have been widely recognized as effective tools for improving reading fluency, comprehension, and learner attention, especially among beginning readers and struggling readers (Wood et al., 2022; Lin et al., 2024). Highlighted text synchronized with audio narration helps learners connect spoken and written language, thereby strengthening decoding skills and supporting reading accuracy (Schroeder & Senn, 2021). Such visual-audio integration has been shown to enhance learners' ability to follow reading sequences and maintain focus during digital reading tasks.

Overall, these recommended enhancements are expected to further increase the **effectiveness, usability, and sustainability** of the Apple Sound Check App as an instructional tool for oral reading fluency in the English language classroom. Continuous system improvement, localization of speech technologies, and integration of interactive visual features contribute to more responsive and learner-centered digital learning environments (UNESCO, 2023; OECD, 2025). Therefore, implementing these enhancements will not only address the identified limitations but also strengthen the long-term applicability and instructional value of the developed reading application.

Conclusions

1.Apple Sound Check Reading App had substantial improvement in students' reading fluency after its used across all four reading components. Students demonstrated low to very low fluency levels Before the intervention. But after the intervention, all indicators showed marked increases in mean scores and corresponding percentage that reached high fluency levels.

2.Apple Sound Check Reading App was developed as an output of this study to help in enhancing oral reading fluency of the Grade 7 learners. It considered a lot of features such as: progress tracking, performance analytics dashboard, leveled reading texts, automated pronunciation feedback, teacher monitoring options, and more interactive reading exercises to make the application more responsive to the varying needs of learners and teachers.

3.The developed Apple Sound Check Reading App was best implemented in the English language classroom accompanied by series of lessons about reading fluency components and vowel sounds/phonetics, and most importantly with first-hand experienced with the app on speech practice.

4.After the implementation of the Apple Sound Check Reading App the results revealed a statistically significant improvement in students' reading fluency across all four reading components — accuracy, phrasing, pronunciation, and rate/speed. It showed highly significant differences between pre- and post-assessment scores. Therefore, the Apple Sound Check App should be integrated in English classroom as reading intervention.

5.The developed Apple Sound Check Reading App obtained the highest mean scores as to its indicators were interpreted as *strongly agree*, which means that *the indicators were highly observed, acceptable, and related to the required standard* as statistical results shown about the Level of its Acceptability.

6.As the evaluation result, Apple Sound Check App be further enhanced by improving its stability features, particularly in software maintenance, system updates, uninterrupted performance, additional options for AI-generated voice model that must aligned with the Filipino accent, and highlighted the read words to further increased the app's effectiveness, usability, and sustainability as an instructional tool for oral reading fluency.

Overall, the study established that the Apple Sound Check App was a useful, effective, and acceptable innovation for enhancing the oral reading fluency of high school students in the English language classroom.

Recommendations

In light of the conclusions, the following recommendations were proposed:

Students. Students, especially those who had struggled in reading, were encouraged to engage the developed Apple Sound Check Reading App to enhance the oral reading fluency. It could possibly provide opportunities to learners to practice more by themselves. The more students practiced in reading, the more they became fluent.

Teachers. Teachers, especially those handling struggling-readers, were encouraged to adopt the Reading App as a supplementary instructional material in teaching, help boost students' oral reading fluency, and served as a reading partner. It might be integrated into classroom reading activities, remedial instruction, and intervention programs.

School Administrators. They should support the use of technology-based innovations, encouraged Teachers to integrate digital reading tool such as the Apple Sound Check reading app to combat the reading problem that schools yearly experienced by providing the necessary resources and training for its effective implementation. Also, it would be useful to primary learners too.

Future Researchers. Future studies should explore the impact of the developed reading app to validate and extend its applicability. Hoping for varied versions on software model from offline system upgraded to online and even for android app version to be developed in the future as well.

Another set of recommendations to further enhance the effectiveness, usability, and sustainability of the **app** as a tool in improving oral reading fluency:

1. Enhancement of System Stability and Maintenance.

It was recommended that the developers implement regular **software maintenance, updates, and system optimization** to ensure uninterrupted performance and long-term reliability of the application. Continuous software updating has been identified as a critical factor in maintaining application reliability, improving system efficiency, and enhancing user satisfaction in educational technologies (Wimalasooriya et al., 2022; Ghabban & Ghaban, 2025). In addition, routine performance monitoring and debugging

processes should be incorporated to maintain consistent functionality and ensure the sustainability of the application in classroom environments (Alenezi, 2023).

2. Integration of Localized AI-Generated Voice Features.

It was recommended that future versions of the application incorporate **AI-generated voice options that aligned with the Filipino accent** to better support pronunciation development among learners. The inclusion of culturally and linguistically relevant speech models can improve learners' familiarity with phonological patterns and enhance their listening and speaking abilities (Liu et al., 2023; Kohnke & Moorhouse, 2022). Moreover, localized speech synthesis has been found to promote learner engagement and increase comprehension among English language learners in multilingual educational settings (Rahman et al., 2024). This enhancement will further support the goal of improving oral reading fluency in English while addressing the specific linguistic needs of Filipino learners.

3. Implementation of Word Highlighting and Visual Reading Supports.

It was further recommended that the application include **synchronized word-highlighting features** to visually guide learners during reading activities. Visual cues such as highlighted text have been shown to support reading accuracy, improve decoding skills, and enhance learner attention during reading tasks (Wood et al., 2022; Lin et al., 2024). The integration of audio-visual supports allowed learners to connect spoken and written language more effectively, thereby strengthening reading comprehension and fluency (Schroeder & Senn, 2021). This feature would be particularly beneficial for beginning readers and learners who required additional reading support.

4. Strengthening Accessibility and Inclusive Learning Features.

It was recommended that the application be further enhanced to support **greater accessibility and inclusivity**, ensuring that learners from diverse backgrounds and abilities could effectively use the application. This might include adjustable font sizes, customizable display settings, and user-friendly navigation tools. Educational technologies that prioritize accessibility have been shown to create more inclusive learning environments and reduce barriers to participation among learners with diverse needs (UNESCO, 2023; Navas-Bonilla et al., 2025).

5. Expansion of Instructional Content and Learning Activities.

Future development of the application may include the addition of **more reading passages, interactive exercises, and differentiated learning materials** suited to various reading levels. Expanding instructional content allows learners to practice reading skills in diverse contexts and promotes continuous improvement in fluency development (OECD, 2025). Providing varied learning materials also supports individualized learning and enhances learner engagement, which are essential components of effective digital learning environments (Liu et al., 2024).

6. Conduct of Continuous Evaluation and User Feedback Integration.

It was recommended that **continuous evaluation and user feedback mechanisms** be implemented to assess the performance and usability of the application over time. Gathering feedback from teachers, students, and educational stakeholders could help identify areas for improvement and ensured that the application remains relevant to instructional needs. Ongoing evaluation has been recognized as a vital strategy in improving the quality and effectiveness of digital learning tools (Alenezi, 2023; UNESCO, 2023). Incorporated feedback-driven improvements would contribute to the long-term sustainability of the application.

7. Implementation of Professional Development for Teachers.

t was also recommended that teachers be provided with **training and orientation sessions** on the proper use of the Apple Sound Check App to maximize its instructional benefits. Teacher readiness and technological competence play a significant role in the successful integration of digital learning tools into classroom instruction (Forsström et al., 2025; UNESCO, 2023). Providing professional development opportunities would help educators effectively utilized the application and integrated it into their reading instruction strategies.

8. Future Research and Large-Scale Implementation.

Finally, it was recommended that future studies be conducted involving **larger samples, different grade levels, and varied educational settings** to further validate the effectiveness of the application. Expanding the scope of research would allow for more comprehensive evaluation and provide stronger empirical evidence regarding the impact of digital reading tools on learners' oral reading fluency (Liu et al., 2024; OECD, 2025). Such research efforts would contribute to the continuous development and improvement of technology-assisted reading interventions.

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FRAMEWORK FOR LRMDS

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103

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104

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