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Rural ESL Teachers' Perceptions of a Mobile Reading Application for Reading Instruction

Persepsi Guru ESL Luar Bandar Terhadap Aplikasi Membaca Mudah Alih Untuk Pengajaran Kefahaman Membaca

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ABSTRACT

Reading comprehension remains a persistent challenge in rural Malaysian primary ESL classrooms, where teachers often experience constraints in accessing pedagogically suitable and contextually relevant instructional materials despite the increasing availability of mobile technologies. While mobile applications have been widely promoted for language learning, limited empirical attention has been given to how rural ESL teachers perceive their use for reading instruction. This qualitative case study explores rural upper primary ESL teachers' perceptions of using ComprehendIt, a mobile reading application designed to support reading comprehension instruction. Six rural ESL teachers participated in the study over thirteen weeks. Data were collected through semi-structured interviews, classroom observations, weekly reflections, summative reflections, teachers' group chat discussions, and log activity, and were analysed thematically. Guided by the Technology Acceptance Model (TAM), the findings revealed four interrelated themes shaping teachers' perceptions: (i) ease of use and preparation efficiency, (ii) pupil engagement, (iii) technical barriers, and (iv) professional confidence and attitudes. Teachers perceived the application as easy to use and time-efficient, particularly in reducing preparation workload through predictable instructional routines, simple navigation, and projection features. The application was also viewed as instructionally useful in enhancing pupil engagement through visual supports, structured worksheets, and interactive activities. However, these positive perceptions were moderated by rural contextual constraints, including unstable internet connectivity, technical glitches, limited digital familiarity, and readability issues. Despite these challenges, teachers' confidence and attitudes towards continued use became increasingly positive over time. This study contributes empirical insight into rural ESL teachers' perceptions of mobile learning for reading instruction and highlights the importance of contextualising technology acceptance within rural educational realities. The findings underscore the need for user-centred, teacher-supportive mobile applications to promote sustainable technology adoption in resource-constrained ESL classrooms.

Keywords: mobile learning; reading instruction; rural ESL teachers; teacher perceptions; technology acceptance.

ABSTRAK

Kefahaman membaca kekal sebagai satu cabaran berterusan dalam bilik darjah ESL sekolah rendah luar bandar di Malaysia, di mana guru sering berdepan dengan kekangan dalam mengakses bahan pengajaran yang sesuai dari segi pedagogi dan relevan dengan konteks setempat, meskipun ketersediaan teknologi mudah alih semakin meningkat. Walaupun aplikasi mudah alih telah banyak dipromosikan untuk pembelajaran bahasa, perhatian empirikal terhadap bagaimana guru ESL luar bandar menilai penggunaannya untuk tujuan pengajaran kefahaman membaca masih terhad. Kajian kes kualitatif ini meneroka persepsi guru ESL tahap atas sekolah rendah luar bandar terhadap penggunaan **ComprehendIt**, iaitu sebuah aplikasi membaca mudah alih yang direka untuk menyokong pengajaran kefahaman membaca. Seramai enam orang guru ESL luar bandar telah terlibat dalam kajian ini sepanjang tempoh pelaksanaan selama tiga belas minggu. Data dikumpulkan melalui temu bual separa berstruktur, pemerhatian bilik darjah, refleksi mingguan, refleksi sumatif, perbincangan kumpulan sembang guru, serta log aktiviti aplikasi, dan dianalisis secara tematik. Berpandukan Model Penerimaan Teknologi (Technology Acceptance Model, TAM), dapatan kajian mendedahkan empat tema saling berkaitan yang membentuk persepsi guru, iaitu: (i) kemudahan penggunaan dan kecekapan penyediaan pengajaran, (ii) penglibatan murid, (iii) halangan teknikal, dan (iv) keyakinan serta sikap profesional. Guru menilai aplikasi tersebut sebagai mudah digunakan dan menjimatkan masa, khususnya dalam mengurangkan beban penyediaan pengajaran melalui rutin pengajaran yang boleh diramal, navigasi yang ringkas, dan ciri unjuran bahan. Aplikasi ini juga dilihat berguna dari segi pengajaran kerana dapat meningkatkan penglibatan murid melalui sokongan visual, lembaran kerja berstruktur, dan aktiviti interaktif. Walau bagaimanapun, persepsi positif ini dipengaruhi oleh kekangan konteks luar bandar, termasuk ketidakstabilan sambungan internet, gangguan teknikal, tahap literasi digital yang terhad, dan isu kebolehbacaan teks. Meskipun berdepan dengan cabaran tersebut, keyakinan dan sikap guru terhadap penggunaan berterusan aplikasi ini semakin positif dari semasa ke semasa. Kajian ini menyumbang pandangan empirikal terhadap persepsi guru ESL luar bandar mengenai penggunaan pembelajaran mudah alih untuk pengajaran kefahaman membaca serta menekankan kepentingan mengontekstualkan penerimaan teknologi dalam realiti pendidikan luar bandar. Dapatan kajian turut menegaskan keperluan pembangunan aplikasi mudah alih yang berfokuskan pengguna, menyokong keperluan guru, dan mampu menggalakkan penerapan teknologi yang mampan dalam bilik darjah ESL yang berhad sumber.

Kata kunci: aplikasi pembelajaran mudah alih; pengajaran bacaan; guru ESL luar bandar; persepsi guru; penerimaan teknologi.

INTRODUCTION

English remains a critical language for global communication, education, and knowledge exchange, reinforcing its continued importance within national education systems worldwide (Mehrajuddin & Wani, 2022). In Malaysia, despite the dominance of Bahasa Melayu as the primary medium of communication, English continues to hold a central position as a compulsory subject in both primary and secondary education under the Malaysian Education Blueprint 2013–2025 (Ministry of Education Malaysia, 2013; Abu Bakar et al., 2021). Within English language learning, reading comprehension is widely recognised as a foundational skill that supports academic achievement, critical thinking, and knowledge acquisition across disciplines (Smith et al., 2021; Ramadhani et al., 2023).

To strengthen English proficiency, Malaysia has aligned its curriculum with international standards through the implementation of the Common European Framework of Reference for Languages (CEFR) (Mohamad Uri, 2023). While CEFR-aligned materials have contributed to systematic reading instruction, particularly those in rural schools to have expressed concerns regarding cultural relevance and contextual suitability (Ya Shak et al., 2021; Katawazai et al., 2022; Yahaya & Wong, 2024). Research has shown that pupils comprehend texts more effectively when learning materials reflect familiar cultural contexts, highlighting the importance of localisation in reading

instruction (Liu, 2024; Mo, 2024). Consequently, teachers' perceptions of available instructional resources play a crucial role in shaping how reading comprehension is taught in rural ESL classrooms.

Beyond curriculum alignment, the Malaysian education system has increasingly emphasised the integration of digital technologies to support 21st-century learning (Alih et al., 2021). Educational technology has been shown to enhance learner engagement and support more student-centred approaches to language learning (Roshan et al., 2022). However, studies consistently report that teachers' readiness and perceptions remain key barriers to effective technology integration, particularly in rural contexts where infrastructural and pedagogical support is uneven (Mohamed Hashim et al., 2022; Donald & Hashim, 2025).

The COVID-19 pandemic further accelerated the shift towards digital and mobile-based learning, exposing both opportunities and challenges for teachers. While mobile devices became the most commonly used tools for online learning, many teachers reported limited preparedness and reliance on readily available online materials rather than pedagogically designed resources (Thang et al., 2022; Kamalaudin & Sundarasen, 2023). These experiences have had lasting implications for teachers' perceptions of digital tools, influencing their confidence, motivation, and willingness to integrate mobile applications into post-pandemic classroom instruction.

Research has consistently shown that teachers' perceptions of usefulness, ease of use, and contextual relevance significantly influence their acceptance of educational technology (Davis, 1989; Venkatesh & Davis, 2000). In rural ESL settings, these perceptions are further shaped by time constraints, workload, pupil diversity, and access to suitable teaching materials (Sulaiman et al., 2024). Although mobile-based teaching resources have demonstrated positive outcomes in supporting language learning, their effectiveness depends largely on teachers' acceptance and perceived instructional value rather than technological availability alone (Garzón et al., 2023).

Despite growing interest in mobile learning for ESL instruction, there remains limited empirical research focusing specifically on rural ESL teachers' perceptions of mobile applications for reading instruction. Understanding these perceptions is essential, as teachers serve as the primary gatekeepers of technology integration in classrooms. Addressing this gap, the present study focuses on rural ESL teachers' perceptions of a mobile reading application to inform more context-sensitive, teacher-centred approaches to mobile learning integration in Malaysian rural schools.

PROBLEM STATEMENT

The rapid expansion of digital learning has transformed educational practices worldwide, enabling teachers and pupils to access instructional materials beyond traditional classroom boundaries (Alqurashi, 2025). In Malaysia, this digital shift has been strongly encouraged within English as a Second Language (ESL) education, particularly to support reading comprehension instruction (Jendia & Ismail, 2023). With mobile phone penetration exceeding the national population, mobile devices are widely available among teachers, suggesting strong potential for pedagogical integration (Kempt, 2024). However, despite this high level of technological accessibility, mobile devices remain underutilised as instructional tools in ESL classrooms, particularly for supporting teachers' reading instruction (Pozos-Pérez et al., 2022; Zain & Bowles, 2021).

This underutilisation highlights a critical disconnect between technological availability and pedagogical implementation. Research consistently indicates that the successful integration of educational technology depends less on access and more on teachers' perceptions, including perceived usefulness, ease of use, and alignment with instructional needs (Davis, 1989; Venkatesh & Davis, 2000). In Malaysian ESL classrooms, teachers' perceptions are further shaped by time constraints,

workload, and varying pupil proficiency levels, all of which influence their willingness to adopt new instructional tools (Sharif & Mahmood, 2023; Sulaiman et al., 2024).

Although reading comprehension is a core component of the English curriculum and is central to assessment frameworks guided by the CEFR, Malaysian pupils continue to demonstrate low engagement with reading activities, with many identified as reluctant readers (Chandran & Shah, 2019). This reluctance is closely linked to limited vocabulary, insufficient background knowledge, and reduced motivation, placing greater instructional demands on teachers (Le et al., 2024). Consequently, teachers play a pivotal role in mediating reading comprehension instruction, as the effectiveness of instruction depends not only on curriculum design but also on how teachers perceive and implement available teaching resources (Tanabalan et al., 2023).

In rural and resource-constrained contexts, these challenges are intensified. Teachers often face limited access to culturally relevant and pedagogically appropriate materials, making it difficult to design engaging reading lessons (Chua & Sulaiman, 2021). While mobile and digital learning resources have been shown to enhance engagement and support language learning, studies caution that such benefits are realised only when teachers perceive these tools as supportive rather than burdensome (Garzón et al., 2023; Ishaq et al., 2021). Without positive teacher perceptions, technology adoption risks remaining superficial or unsustained.

Despite growing interest in mobile learning for ESL instruction, there is limited empirical research focusing specifically on Malaysian rural ESL teachers' perceptions of mobile applications for reading instruction. Most existing studies emphasise technological effectiveness or student outcomes, while teachers' perspectives regarding instructional practicality and contextual suitability remain underexplored. This gap underscores the need to investigate how teachers perceive mobile teaching resources, as their acceptance ultimately determines whether such tools are meaningfully integrated into classroom practice. Accordingly, this study seeks to address this gap by examining rural ESL teachers' perceptions of a mobile reading application, with particular attention to perceived usefulness, ease of use, and instructional relevance. Understanding these perceptions is essential for informing teacher-centred, context-sensitive approaches to mobile learning integration in Malaysian ESL classrooms.

LITERATURE REVIEW

We must utilise abundant teaching materials, as the availability of online learning materials presents an opportunity to enhance our pedagogical skills. According to Crompton and Burke (2020), some scholars suggest that mobile devices can be implemented to modify the learning process by offering flexible interactions. The technology used in this era implied the changes in our education system as it parallels modernisation. This freedom to find more knowledge and information with fewer restrictions through the internet has helped individuals at various stages of the learning process (Wang & Lehman, 2021). The learning process was more smoothly conducted than in the past. Thus, it is another advantage for today's generation to learn anywhere as long as the devices are connected to the internet.

The similarity between m-learning and e-learning is the practicality of learning that can occur anywhere or anytime. Ozdamli and Cavus (2011) listed the essential elements of mobile learning as teachers, learners, content, assessment, and environment. Meanwhile, the characteristics of mobile learning include blended learning, interactive, collaborative, private, and portable mobile tools. If all the elements and attributes are fulfilled, the users can experience authentic learning anywhere or anytime, flexibly.

Advantages of mobile learning technology for ESL teachers

The language learning process for second language learners to learn a new language using mobile devices has become a trend. The percentage of households in Malaysia for 2024 that have access to mobile phones is 99.5%, based on the Malaysian Department of Statistics (2025). The findings additionally point out that the rural household internet access has reached 90.3% with mobile phones having become a reliably connected device in remote areas, with 90.0% of the users using the internet to download software or applications. Therefore, this strengthens the study's aims to employ mobile applications such as ComprehendIt as practical teaching instruments in rural ESL classrooms.

Mobile phones function as flexible and accessible educational mediums, allowing teachers to access and browse educational resources from any location in any context (Lam et al., 2010). The portability of mobile devices enables teachers to integrate mobile learning into their current teaching practices seamlessly, as mobile phone ownership in Malaysia has increased over time. Teachers' teaching skills and knowledge will be enhanced as teachers can access a wide range of educational resources and training materials through mobile phones (Tong et al., 2023). Similarly, as quoted by Tong et al. (2023) and Dahri et al. (2024), both studies agree that mobile learning facilitates teacher participation in professional development activities at their mobility, allowing them to remain updated about the current educational trends and practices. Integrating mobile learning technologies in education can present a promising avenue for empowering rural teachers by fostering continuous professional growth, ultimately leading to more engaging and effective teaching experiences, who seldom attend formal workshops due to distance and costs (Hennessy et al., 2022).

According to the research made by Ismail et al. (2021), teachers' acceptance of mobile technology adapted for teaching in Malaysian secondary schools showed that teachers are impressed to integrate it with their lessons. In particular, teachers are motivated to incorporate mobile technology as their teaching aids due to their natural habits and internal motivation to encourage active student participation. The researchers believe mobile technology makes it possible to utilise pedagogical materials. Teachers' positive acceptance of mobile integration is proof of teachers' readiness for the changes towards modern learning styles. Similarly, in the study by Nikolopoulou et al. (2023) not all teachers are proficient enough to use mobile devices for teaching and learning. Teachers' readiness is essential to equip them with coherent instructions and practical guidance as the ones who deliver the lesson.

Furthermore, mobile technology can promote collaboration and communication among teachers. A collaborative learning environment can be fostered by enhancing communication among teachers and peers and between teachers and pupils (Hassan et al., 2024). The same study indicates positive changes in teachers' instructional methods due to the convenience of communication among the participants. Another recent study by Thaanyane and Jita (2024) argues that mobile technology empowers collaborative learning mediums between teachers through the dynamic flexibility of education discussion. Therefore, both findings strengthen the adaptation of innovative instructional teaching techniques, and the collective progression of teaching practices could be enhanced as a result of the idea-sharing collaboration among teachers, especially in rural areas where the distance among teachers is challenging.

The accelerated progress of mobile technology has created new opportunities for language learning, especially in English as a Second Language (ESL) instruction. Mobile-based ESL applications are an appealing resource for teachers to improve their teaching methods and help pupils improve their language skills. Despite the increasing interest, substantial gaps exist in the current literature about mobile-based ESL courses for teachers. Kamal et al. (2021), in their study to assess teachers' perspectives on using guided mobile learning using the Mobile Intervention Module (MIM) in English language instruction, found that all instructors positively perceive assisted mobile learning through the MIM, as indicated by the results. This study suggests that guided mobile learning can help transition

teaching methods from traditional to technology-assisted, incorporating interactive activities in learning, improving language abilities, and increasing engagement. As for future research suggestions, it is advised that mobile learning should be incorporated into lessons in a guided approach for optimal outcomes. This study suggests that a well-structured teaching content integrating the curriculum with mobile applications is required.

Another study conducted by Alotaibi and Alharbi (2022) to explore the impact and benefits of mobile device games for learning English as a Foreign Language (EFL) vocabulary on student achievement in a Saudi female public high school was based on the effectiveness of module implementation. This experimental study used differentiated approaches of traditional teaching methods and mobile gamification module integration to teach English. The study's finding suggests that teachers are advised to incorporate mobile educational games into their teaching methods as they can be beneficial motivators for learning, particularly for young children, which findings similarly Sadeghi et al. (2022). Furthermore, gamification in mobile learning offers a customised and flexible learning experience tailored to each student's specific needs and preferences (Ezekwe, 2025).

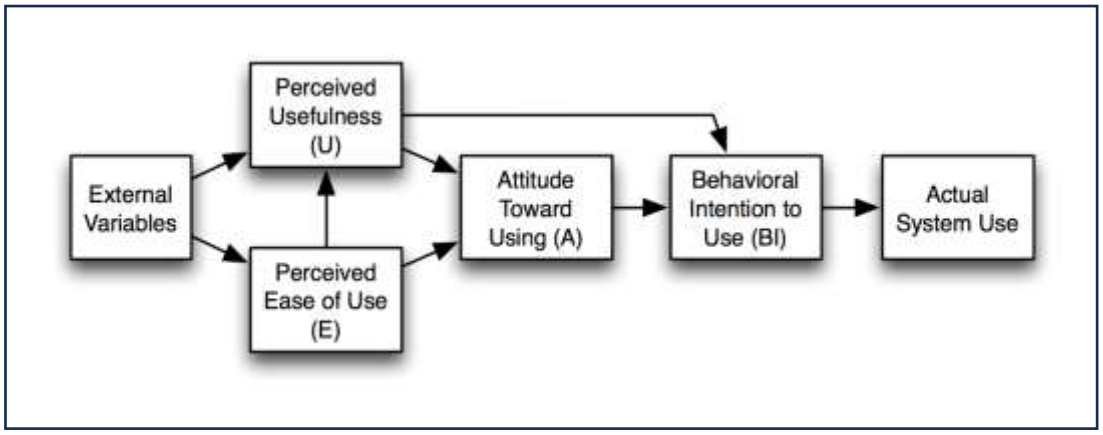
On the other hand, gamified mobile learning instruments can utilise data analytics and algorithms to evaluate student performance and adapt the difficulty level, material, and pace of instruction accordingly. Another study by Bibi and Anyanwu (2023) assessed how teachers in a primary school in Seychelles adapted to pupils' learning patterns through the implementation of gamification. While the teachers relied on traditional approaches rather than tested instruments to determine learning styles, the research underlined the necessity of tailoring teaching approaches to pupils' preferred learning modes, such as gamification through mobile applications. Conventional ESL instruction typically integrates uniform teaching practices that lack to accommodate pupils' differentiation, language background, and learning styles, which has become an issue that is even more pronounced in heterogeneous rural classrooms.

In addition to the advantages of mobile-based resources, teachers face challenges such as the need for professional development and resistance to change. Effective implementation of mobile technology in education does not occur overnight without relevant support. Teachers require comprehensive training and sustained support to integrate digital resources in adapting instructional methodologies (Nikolopoulou et al., 2021). Providing teachers with mobile learning technologies for education is insufficient because the potential benefits are not fully utilised without adequate professional development. Even when technological tools are available, they remain underutilised if teachers lack the pedagogical knowledge and digital skills required to implement them effectively. Additionally, some teachers are reluctant to adopt mobile based instrument in their teaching process as they feel too comfortable with the existing traditional teaching methods (Lomba et al., 2022). This sceptical culture towards technology can impede the integration of mobile learning throughout the teaching process.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was introduced by Fred Davis in 1986 to predict users' acceptance and use of technology. Initially, the model was grounded in the Theory of Reasoned Action (TRA), while the primary factors that affected the reason for technology utilisation were limited to two factors. The two primary factors are perceived usefulness and perceived ease of use (Davis, 1989; Venkatesh et al., 2003). Later on, with the evolution of the model over time, the model was improved with four core constructs. The core constructs of TAM are illustrated in Figure 1.

Figure 1: Technology Acceptance Model (TAM)



Source: Davis (1989)

As the most important factor for technology adaptation, perceived usefulness (PU) refers to the degree to which individuals believe technology utilisation will enhance their productivity (Lin et al., 2007). Perceived Ease of Use (PEOU) defines an individual conceptualisation that implementing technology would require minimal effort to complete their jobs or tasks (Fachrulamry & Hendrayati, 2021; Fowe & Boot, 2022). Behavioural Intention to Use (BI) indicates the behavioural intentionality of using technology (Fernandez & Garido, 2023). The Attitude Toward Using (ATU) construct represents the emotional acceptance towards technological functionality (Taylor &Todd, 1995; Cenfetelli & Schwarz, 2010). The Technology Acceptance Model has demonstrated a profound theoretical framework of the technological landscape across numerous domains, including mobile applications, social media platforms, digital transactional platforms, and organisational information systems.

While the original TAM provided crucial insights into technology acceptance, subsequent scholars have addressed the limitations of the original framework by integrating additional constructs. The evolution of TAM2 from TAM was made by Venkatesh and David in 2000 with the extension of additional factors such as cognitive instrumental processes and social influence of subject norms (Venkatesh & David, 2000). The significant difference between TAM and TAM 2 is the contextual flexibility that considers the role of social and organisational factors compared to the first version, which is limited to an individual's personal decision (Sargolzaei, 2017). Later on, in 2008, another version of TAM 3 was introduced by Venkatesh and Bala, which has been claimed as a further refined model. Additional constructs for a better understanding of technology acceptance have been added for TAM 3, such as experience and voluntariness (Tang & Chen, 2011).

The last evolution of TAM is known as the Unified Theory of Acceptance and Use of Technology (UTAUT) to improve various models (Venkatesh et al., 2003). The UTAUT systematised eight models and theories previously into a more robust framework. However, the evolution of the TAM model has resulted in theoretical chaos among academicians, confusing them about which versions will suit their research objectives (Bensabat & Barki, 2007). Therefore, some studies suggest focusing on the initial beliefs because user perceptions can dynamically evolve with changes over time, indicating a need for a more dynamic model (Cochran et al., 2006; Mim & Sheng, 2007; Al-Natour et al., 2021). As both researcher and mobile app developer for this study, the researcher believes the practical implications based on TAM assist in a more comprehensive understanding of technology acceptance to create user-centric technology that is personalised by users' technological needs and experiences. However, even when technology is available, adoption remains unlikely unless tools are simple, lightweight, and clearly beneficial within their challenging classroom conditions.

Recently, some researchers employed TAM as the theoretical framework for their study of teaching reading skills. The findings of Sabeen et al. (2024) on the influence of technology-assisted reading interventions for reading comprehension to identify English Language Learners' (ELLS) perception have improved learners' comprehension and vocabulary enrichment and promoted participation in learning sessions. Chen (2024) discovered that the introduction of TAM and adaptation to the English teaching model of "Knowing and Doing" conducted by the teachers has improved pupils' grades by considering the core constructs of perceived ease of use, usefulness, and learning behaviour. Synthesising these findings reveals common themes of reading comprehension performance level improvement among pupils and positive perception towards technology, but also identifies the need for equitable technology-assisted intervention, specifically in teaching reading instruction. However, these studies also reveal that accessibility and training remain major barriers because issues that disproportionately impact rural teachers, who often have less digital support than their urban counterparts.

METHODOLOGY

This study employed a qualitative case study design to explore rural ESL teachers' perceptions of using a mobile reading application for reading instruction. Six upper primary ESL teachers from rural schools participated in the study over a thirteen week period. A case study is a study used by the researcher to understand contemporary issues or to explore phenomena in terms of an in-depth understanding (Merriam,2009; Coombs,2022). It is a detailed investigation into a specific context by reducing a broad research field into generalised findings (Heale & Twycross, 2017).

This study has fulfilled some of the characteristics of a case study, such as the study being defined or described with some parameters (Creswell & Poth, 2018), focusing only on reading comprehension teaching instructions in rural settings instead of broader English language skills. Another characteristic is that the case study is characterised by its emphasis on preserving empirical intimacy with the subject, which consists of a unique combination of various methodological techniques (Sandelowski, 2011). Data that were derived for this study are from various sources, such as interviews, document analysis, open-ended questionnaires, log files, classroom observations, and reflections.

The sites chosen for this research study are rural primary schools around the Kota Kinabalu and Tuaran districts in Sabah. The researcher has chosen National Schools rather than National-Type Schools due to their wider reach and student demographics. National Schools comprise most primary schools in Malaysia. These institutions cater to teachers and pupils of diverse nationalities and socioeconomic backgrounds nationwide. This facilitates the acquisition of a more comprehensive and reliable sample for research purposes. Other than that, due to the language dominance of English as a second language rather than other native languages.

Teachers function as essential pillars in assisting pupils with their comprehension process through the ability to clarify strategies, offer feedback, and tailor instructions to meet pupils' needs (Nguyen, 2022; Duke et al., 2011). To address this case study research question on exploring teachers' perceptions and adaptation to the ComprehendIt app, the purposive sampling method was undertaken for the richness of data contribution from the samples (Wan, 2019; Nyimbili & Nyimbili, 2024). The teachers' digital literacy level was also considered, as the selected samples need at least basic digital literacy and practical accessibility to utilise mobile technology. Table 1 illustrates the mobile app integration management plan for this study.

Table 1: The Mobile App Management Plan

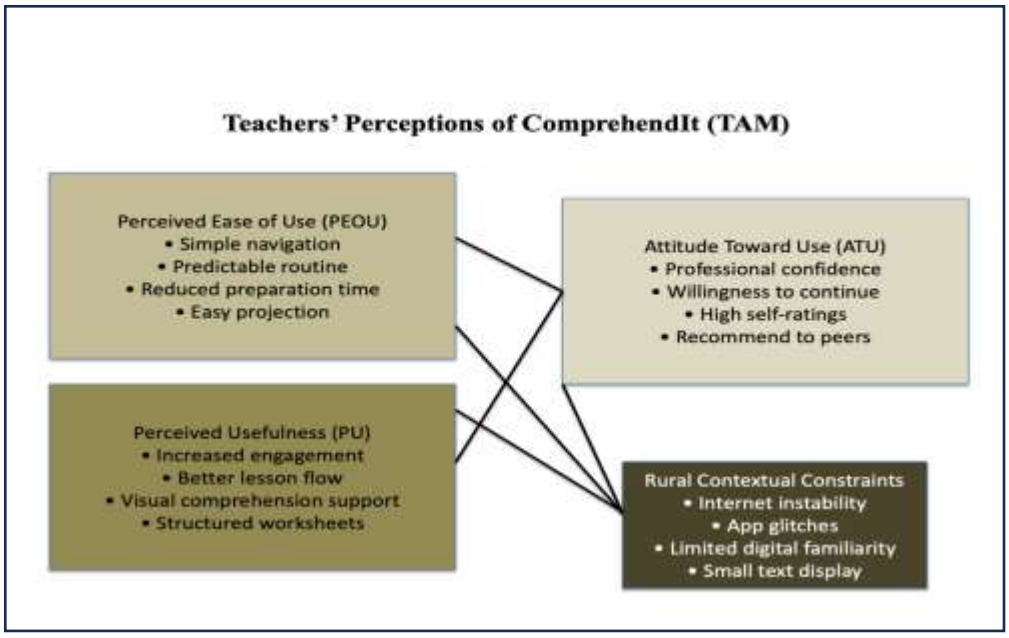
Timeline	Activities
Week 1	Instructions were explained to the teachers through online discussion. Trial and error of the prototype. Consent from participants. Digital literacy questionnaire was completed.
Week 2 Week 3 Week 4 Week 5 Week 6 Week 7	First unit was chosen through the mobile app based on teachers' preferences. Teachers completed the writing on daily reflections. First observation was conducted. Discussion in the group chat via mobile app.
Week 8 Week 9 Week 10 Week 11 Week 12 Week 13	Second unit was chosen through the mobile app based on teachers' preferences. Teachers completed the writing on summative reflections. Second observation were conducted. Discussion in the group chat via mobile app.
Week 14	Teachers interviewed individually.

Data were collected through semi-structured interviews, weekly reflections, and summative reflections. These data sources were selected to capture teachers' perceptions over time and to provide rich, contextualised insights into their experiences. All data were analysed thematically using an iterative coding process. The analysis was guided by the constructs of the Technology Acceptance Model, while remaining open to emergent themes. Trustworthiness was enhanced through data triangulation and prolonged engagement with the participants.

FINDINGS AND DISCUSSIONS

The analysis revealed four key themes that shaped teachers' perceptions of the mobile reading application ComprehendIt for reading instruction to teach reading comprehension. Figure 2 presents an integrated interpretation of teachers' perceptions of ComprehendIt using the Technology Acceptance Model (TAM).

Figure 2: Teachers' Perception of ComprehendIt (TAM)



The findings indicate that teachers' acceptance of the mobile application was primarily driven by perceived ease of use and perceived usefulness, which jointly shaped positive attitudes toward continued use. Ease of use was reflected in teachers' emphasis on reduced preparation time, predictable instructional routines, and simple navigation, while usefulness was associated with enhanced pupil engagement, visual support, and structured comprehension activities. However, these perceptions were moderated by rural contextual constraints, including unstable internet connectivity, technical glitches, limited digital familiarity, and readability issues. Although these constraints occasionally disrupted classroom implementation, they did not entirely diminish teachers' willingness to adopt the application, highlighting the importance of contextualising technology acceptance within rural educational realities.

Evidence was drawn from interviews (INT), daily reflections (DRF), summative reflections (SRF), classroom observations (OBS), teachers' group chat discussions (GCD), and log activity. Four themes emerged: (i) ease of use and preparation efficiency, (ii) pupil engagement, (iii) technical barriers, and (iv) professional confidence and attitudes. These themes are interpreted using the Technology Acceptance Model (TAM) (Davis, 1989), which has been widely applied in educational technology research to examine user adoption of new tools. TAM proposes three core constructs: Perceived Ease of Use (PEOU), the degree to which a system is perceived as effortless to use; Perceived Usefulness (PU), the extent to which a system is perceived to improve job performance; and Attitude Toward Use (ATU), users' overall preference and intention to continue using the tool (Davis, 1989). Using TAM as an interpretive lens allows a clearer explanation of how rural ESL teachers appraised ComprehendIt's usability and instructional value while navigating resource-limited teaching environments.

Ease of Use and Preparation Efficiency (Perceived Ease of Use – PEOU)

The first theme reflects teachers' perception of ComprehendIt as accessible and time-efficient, particularly in terms of lesson preparation, navigation, and classroom pacing. Teachers highlighted the app's straightforward interface and predictable layout, which reduced effort when accessing texts, flashcards, and worksheets. This perception was evident in reflections and observations, such as Teacher A's comment: "I am beginning to feel more confident using the app as part of my teaching" (SRF_TA), and observation notes indicating smoother use over time ("Navigation was easier this time," OBS_TA_02). Log-based evidence further suggested low-effort navigation when teachers accessed targeted materials directly ("teacher taps directly into the topic 2 worksheet without browsing menus," OBS_TB).

Teachers also perceived the app's predictable instructional routine as helpful for lesson pacing. Observations showed repeated sequences (flashcards → reading → worksheets) that helped both teachers and pupils build familiarity ("following the same predictable order…so pupils and teacher build familiarity," OBS_TA_01). Teachers viewed this routine as reducing uncertainty in lesson planning and improving classroom management ("That reading followed by an app-based assessment of worksheets works well," INT_TF).

A further perception related to preparation efficiency was the availability of pre-prepared instructional resources, which reduced workload. Teacher B noted that the app reduced the need to prepare physical materials ("saved me from preparing too many physical materials," DRF_TB) and later reflected: "I am beginning to see how I can save time and reduce my workload if I start trusting the app more" (SRF_TB). Observations corroborated this: "He appreciated that the app provided structured, curriculum-aligned content…reducing his preparation time" (OBS_TB_02).

Finally, teachers valued the projection/display option as a practical feature that reduced administrative tasks such as copying and rewriting materials. Teachers described increased instructional time for discussion and monitoring pupils' understanding: "I realised how much time I saved by projecting the text and flashcards directly" (SRF_TA), and "It reduced my workload and gave me more

time to focus on monitoring pupils' understanding" (DRF_TB). Classroom observations confirmed that projection reduced wasted time and supported interaction (e.g., "more time for discussion with the pupils," OBS_TA_02; "reducing wasted time," OBS_TE_02). Collectively, these perceptions align strongly with PEOU, indicating that user-centred design and time-saving functionality were central to acceptance in resource-constrained rural contexts (Davis, 1989; Venkatesh & Davis, 2000). Comparable patterns are also consistent with Malaysian research emphasising interface simplicity and predictable navigation as key factors in technology adoption (Ismail et al., 2022).

Pupil Engagement (Perceived Usefulness – PU)

The second theme reflects teachers' perception that ComprehendIt increased pupil engagement, which teachers interpreted as a key indicator of instructional usefulness. Teachers reported that pupils were more attentive and participatory when app-based materials were used, particularly through warm-up activities, projection, visuals, and worksheets.

Teachers observed active participation during vocabulary games and riddles: "They responded actively during the vocabulary guessing game" (DRF_TB), and "The riddles…worked surprisingly well as a warm-up" (DRF_TE). Observations reinforced this engagement, with pupils responding to structured pre-reading tasks ("He began the lesson by asking the pupils to answer simple riddles," OBS_TE_01). Teachers also described extending engagement through questioning and connecting activities to pupils' experiences (INT_TC; INT_TD).

Projection was perceived to enhance attentiveness by enabling collective focus. Teachers noted that pupils were more engaged when they had a shared visual reference ("more engaged when they had something visual," SRF_TA), and projection helped everyone focus on the same text ("easier…to focus on the same text together," SRF_TD). Observations recorded active interaction during projected flashcards (OBS_TC_01).

Teachers also perceived that visual aids supported recall and helped weaker pupils infer meaning. Reflections described visuals as enabling faster understanding ("visuals helped the weaker pupils understand faster," SRF_TE), while observations suggested stronger recall compared to textbook only reliance (OBS_TA_01; OBS_TE_01). Interview evidence similarly highlighted the motivational impact of multimedia ("Video…they were like, okay, this is interesting," INT_TC). Structured worksheets were perceived to support focus and participation ("stronger level of participation…than traditional worksheets," DRF_TC; "more focused…marked important words," SRF_TB), with observations confirming improved attention when pupils were given printed texts and worksheets (OBS_TB_02). These engagement-based perceptions align with PU, as teachers evaluated the app's usefulness through observable instructional improvements of attention, participation, smoother lesson flow, and perceived reading progress (Davis, 1989).

Technical Barriers (Constraints shaping PEOU and PU in Rural Contexts)

Despite positive perceptions, teachers reported **technical barriers** that influenced their experiences and moderated acceptance. These included app glitches, difficulties locating resources, unstable internet connectivity, limited familiarity, and small text display.

Teachers described minor navigation disruptions ("some hiccups when switching between sections," DRF_TB) and more severe incidents requiring improvisation, such as drawing on the board when flashcards were inaccessible ("I could not find the prepared flashcards…so I ended up drawing," DRF_TD_01; OBS_TD_01). Interview data echoed problems such as inability to copy text, flashcards failing to open, and the need to restart the app (INT_TB; INT_TC; INT_TF). Group chat messages

showed teachers seeking clarification and troubleshooting functions (GCD_TE), indicating that barriers were sometimes addressed through continued use and support.

Connectivity was a recurring rural constraint. Teachers repeatedly attributed delays and reduced app performance to slow internet ("poor connection…apps won't be working well," INT_TA; "internet's quite slow," INT_TB), and group chat messages captured frustration during slow downloads (GCD_TB). Teachers also raised the limitation of non-offline access ("not offline," INT_TD), reflecting structural realities of digital equity in rural schooling. These barriers are consistent with prior research indicating that infrastructure constraints shape technology adoption in rural Malaysian contexts (Ismail, 2025).

Text readability was another constraint: teachers found passages too small to zoom on some devices ("text…too small," DRF_TC; INT_TF; INT_TD), and observations documented workaround strategies like screenshotting text (OBS_TC_01). Overall, these constraints increased effort and disrupted lesson flow, shaping teachers' perceptions of usability and feasibility.

Professional Confidence and Attitudes (Attitude Toward Use – ATU)

The fourth theme concerns teachers' professional confidence and attitudes, demonstrating how perceptions evolved from initial caution to a stronger willingness to continue using the app. Teachers reported gradual adoption and increasing confidence through practice and familiarity. Reflections showed teachers recognising the need to explore functions more effectively (DRF_TA) and acknowledging that the app still provided structure even when teaching was not fully smooth (DRF_TD). Several teachers reported improved lessons over time ("the lesson went better than before," SRF_TB), and observations confirmed that teachers combined app use with established practices while remaining optimistic (OBS_TB_02).

Prior familiarity with mobile tools supported confidence ("very familiar since the COVID era," INT_TD; "using a mobile device…during my PDP," INT_TE). Repeated practice strengthened comfort and efficiency ("more confident now to combine its materials with my teaching style," SRF_TC; "felt much more natural," SRF_TD; "felt smoother than my first attempt," SRF_TE). Observations corroborated improved control in switching between functions (OBS_TA_02; OBS_TC_02; OBS_TD_02).

Teachers' attitudes were also reflected in self-ratings. Several rated the app highly (e.g., 9/10: INT_TA; INT_TB; INT_TE; INT_TF), indicating strong acceptance despite constraints. Lower ratings were associated with specific functionality issues ("I'd rate seven," INT_TD), suggesting that confidence was shaped by both perceived value and encountered barriers. Teachers additionally indicated intentions to recommend the app to colleagues ("asked my colleague to use," INT_TC; "recommend…to my colleagues," INT_TF), signalling a favourable attitude toward continued use.

These findings align with TAM's pathway that positive judgments of ease and usefulness contribute to more positive attitudes and intentions to continue using a tool (Davis, 1989; Venkatesh & Davis, 2000). They also correspond with studies indicating that favourable evaluations of usefulness and ease predict behavioural intentions in technology adoption research (Ain et al., 2016; Mohd Shahrol et al., 2023). Furthermore, teachers' increasing confidence suggests that user-centred support can foster sustained involvement even in low-resource settings (Chiu et al., 2022; Maja, 2023).

Summary of Integrated TAM Interpretation

In summary, teachers perceived ComprehendIt as easy to use and instructionally useful, particularly for reducing preparation workload and improving engagement during reading lessons. These positive perceptions supported increasing professional confidence and favourable attitudes toward continued use. However, teachers' perceptions were moderated by rural contextual constraints, especially connectivity issues, app glitches, and readability challenges. Holistically, the findings show that TAM constructs were clearly evident in this rural implementation: PEOU was reflected in usability and reduced workload; PU was reflected in engagement and instructional support; and ATU was reflected in growing confidence, high self-ratings, and intentions to recommend. At the same time, the results highlight that teachers' perceptions are shaped by structural realities of digital equity, such as constraints that influence, but do not entirely determine, their readiness to adopt mobile learning tools.

Implications for Practice and Application Design

The findings of this study highlight several practical implications for improving the design and implementation of mobile reading applications in rural ESL contexts. First, technical barriers such as unstable internet connectivity indicate the need for an offline mode feature, allowing teachers to download instructional materials in advance and use them without relying on continuous internet access. This would enhance the reliability of the application in environments characterised by limited digital equity.

Second, issues related to readability, particularly small text size and the absence of zoom functionality, suggest the importance of incorporating responsive design features. Adjustable text sizes and zoom functions would improve accessibility and reduce teachers' reliance on workaround strategies, such as screenshotting materials during lessons.

Finally, although teachers' confidence improved over time, this development was largely driven by trial-and-error experiences. This indicates the need for structured professional training that emphasises pedagogical integration rather than basic technical navigation. Providing targeted training can support teachers in moving beyond initial resistance and facilitate more effective and confident use of the application in classroom instruction.

CONCLUSION

This study explored rural ESL teachers' perceptions of using a mobile reading application for reading instruction. Guided by the Technology Acceptance Model, the findings indicate that perceived usefulness, ease of use, and enhanced professional confidence contributed to positive teacher perceptions, while contextual constraints moderated their acceptance.

By foregrounding teachers' perspectives, this study contributes to a deeper understanding of mobile learning acceptance in rural ESL contexts. The findings highlight the importance of considering teachers' perceptions when designing and implementing mobile learning initiatives to ensure meaningful and sustainable use.

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