

AI-integrated Reading with Google Read Along: ESL Primary Learners Gamified Intervention

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ABSTRACT - This study evaluated an eight-week intervention using Google Read Along with 30 11-year-old ESL learners in Kuala Terengganu, integrating app-based practice in the classroom instruction. A mixed-methods pre-test post-test design was employed, combining reading comprehension tests, a 10-item motivation survey, and semi-structured interviews with five learners. Quantitative results showed significant gains in reading performance, with mean scores increasing from 73.73 (SD = 14.77) to 81.40 (SD = 13.67), producing a medium-large effect size (Cohen's $d_z = 0.79$) and most of the learner's demonstrating improvement, particularly lower-proficiency readers. Motivation data indicated generally positive attitudes toward reading with leader boards recognition and badges included in the app provide strong recognition of its academic value and becoming motivated readers. Interview findings revealed that learners perceived the app as engaging and confidence-building, highlighting benefits for pronunciation, vocabulary, fluency, and reduced reading anxiety, while also observing its practical challenges such as connectivity, device access, technical glitches and accent received by the app. Overall, the findings suggest that Google Read Along can be a valuable catalyst to teaching instruction by providing structured, gamified practice in fluency and comprehension, provided it is implemented within well-resourced, pedagogically positive in ESL classrooms.

INTRODUCTION

Reading proficiency is identified to be an essential requisite to lifelong learning and active engagement particularly in the fast-paced technological global environment (UIL & APCEIU, 2019; UNESCO, n.d.). It allows learners to internalize its learning input and assess their own learning in terms of the contemporary agendas in global citizenship education that focus on critical thinking, ethical consciousness, and active interaction with other points of view (UIL & APCEIU, 2019; UNESCO, n.d.). In the classroom situation, students are able to build their learning pace utilizing their own learning pace as proposed by UIL & APCEIU (2019) and Wang et al., (2020) in learning through empathising and being highly motivated in learning. Based on this, reading is not only a cognitive ability but also an instrument of creating civic engagement and self-development in a globally connected world (UIL & APCEIU, 2019; UNESCO, n.d.; Wigfield et al., 2016).

The modern educational technology has revolutionized teaching and learning reading through the methods it has brought forth the rapidly advancing technology in education. Multimodal input, repeated practice, text-to-speech, read-aloud, adaptive feedback, and other features beneficial to the learner struggling with decoding or just with a limited exposure to the target language are now offered on digital platforms, with the interactive tutoring programme and AI-driven tools (Capodiecici et al., 2020; Musti et al., 2022; Wood et al., 2018). Environmental devices consisting of vocabulary development, reading fluency, and on-task behaviour as well as engagement, persistence, and enjoyment have demonstrated promise through gamified environments based on points, badges, levels, and leaderboards (Abdusalomova and Artikova, 2023; Fahandezh and Mohammadi, 2021; Smiderle et al., 2020; Triantafyllou et al., 2025). Adaptive and intelligent systems could also be used to further personalise the learning and, therefore, monitor performance, adjust difficulty, and provide very specific prompts and feedback, maintaining attention and motivating voluntary engagement with texts, however, it has also been suggested that only a thoughtful use of digital tools in the process of instruction can be effective and careful of guiding reading without causing more shallow processing (Daha, 2023; Delgado et al., 2018).

In Malaysia, such trends in the world are in line with the national initiatives aimed at implementing technology to enhance education. Information and Communication Technology (ICT) is one of the major tools that will be used to make teaching and learning dynamic, reduce discrepancies, and equip students with economic and social needs in the future (Ministry of Education of Malaysia, 2013). In English language education, there is increasing demand to investigate AI-assistant and gamified applications that would facilitate and engage young learners in reading (AI-Matrafi and Almuhammadi, 2025; Jong et al., 2025; Muhamed and Kamsin, 2025). Researchers have found that studies by Badrasawi and Abu Kassim (2020), Chandran and Shah (2019) and Kiew and Shah (2020) indicate that a good number of learners underperform academically in reading comprehension, experience problems in processing main ideas, vocabulary, and inferences and do not have effective strategies to deal with unfamiliar texts, which, in turn, leads to poor reading performance and decreased intrinsic motivation (Jain and Othman, 2019; Nawawi and Hassan, 2021).

This therefore places a great urgency on interventions that would include cognitive and motivational aspects of reading in ESL classrooms in Malaysia at the primary level. The learners need to receive systematic instruction in decoding, vocabulary and comprehension but to ensure that they read meaningfully, enjoy reading, and thus find it relevant to their lives and the future roles of a global citizen (Bakkaloğlu and Pilten 2023; Guay 2022; Ryan and Deci 2000; Wigfield et al. 2016). Google Read Along is an example of such AI-assisted, gamified reading systems and can be a potentially powerful solution since combining adaptive scaffolding with game-like features can help reduce anxiety, develop confidence, and engage with texts actively (Abdusalomova and Artikova, 2023; Shanthasheela et al., 2023; Wook et al., 2021; Yong, 2025; Yulianti and Saputri, 2024). However, evidence of the impact of such tools and the effect of motivation on learning in primary Malaysian ESL learners is limited

to the mixed-methods research, and so is the awareness of learners about the advantages and disadvantages of using these tools as a regular part of learning practice (Fàbregues et al., 2023; Stratton, 2019).

It is on this background that the current study examines the effectiveness of an eight-week-old gamified AI-supplied reading intervention with the help of Google Read Along among Malaysian primary learners (Abdusalomova and Artikova, 2023). Particularly, the research will establish whether the intervention can enhance reading comprehension among learners, to analyze whether it can affect their intrinsic and extrinsic motivation to read in English and to investigate how the learners perceive the advantages and difficulties of the use of Google Read Along in the reading lessons. To these ends, the research questions that the study will deal with are as follows: (1) To what extent does the inclusion of Google Read Along as an AI-based, gamified instrument enhance reading comprehension among ESL learners? The inquiry will be to find the answer to the following: (2) What is the effect of using Google Read Along on reading motivation and engagement in ESL learners? and (3) Which are the perceived advantages and challenges of using Google Read Along and AI-based gamification in the instruction of reading by ESL learners?

LITERATURE REVIEW

21. Theories Underpinning the Study

According to Self Determination Theory suggested by (2017) and Ryan and Deci (2000), the satisfaction of more fundamental psychological needs autonomous, competent and relatedness are highlighted. It plays a central role in developing intrinsic motivation. In the context of reading teaching, these needs have a direct impact on a willingness of the learners to read texts, their persistence in overcoming challenges and a general increase of their reading self-confidence. The self-reinforcing nature of motivation and comprehension was also observed by Wigfield, Gladstone and Turci (2016), whereas Bakkaloğlu and Pilten (2023) showed that motivated readers had better self-efficacy and comprehension performance.

The studies show that in the Malaysian English as a Second Language (ESL) settings, the motivation drives are often obstructed by the lack of vocabulary knowledge, incomplete metacognitive awareness, and bad reading practices (Badrasawi and Abu Kassim, 2020; Chandran and Shah, 2019; Jain and Othman, 2019; Kiew and Shah, 2020; Nawawi and Hassan, 2021). Pedagogical methods of reading are usually characterized by lack of independence, low levels of feedbacks regarding the growth of competencies and little interactive learning. Conversely, the AI-assisted reading tools can provide solutions to this with personalized content, adjustable difficulty level, and feedback. Guay emphasized that AI-based systems could be successfully used in addressing reading difficulties that are specific to the level of a learner, thus, ensuring competence and autonomy, at the same time (Guay, 2022).

Constructivist Learning Theory developed based on the ideas of Vygotsky (1978) considers learning as an active and meaning construction process, which is accomplished through interaction, reflection and use of the pre-existing knowledge. Within the reading situations as suggested by Bada and Olusegun (2015) CLT puts emphasis on centred learning approaches, strategic scaffolding and reading with purposeful texts. Resolving the meaning on linguistic and cultural borders is especially crucial to ESL learners who have to conduct such transactions by being viewed by (Tam, 2000) in his studies on implications of integrating technology into distance learning in activate both their constructivism in learning and reading abilities.

Constructivist pedagogies as a bridge to read Malaysian ESL classrooms continue to be promoted in empirical studies (Chandran and Shah, 2019; Jain and Othman, 2019). Digital technologies, when applied wisely, can operationalize the constructivist principles of educational processes in the form of interactive assignments, scaffolding and reflective learning differentiation. As much as Delgado et al. have highlighted that it might be true that print material could provide better reading performance, it is important to note that reading performance rests on the appropriateness of instructional design in line with the medium of learning (Delgado et al., 2018). Capodiecici et al. (2020) also reported the same outcome once the systematic inclusion of digital reading tools into the pedagogical structures resulted in an increase in understanding. In addition, AI-enhanced apps build on the principles of CLT by delivering text-to-speech feedback, dynamic prompts and real-time corrective feedback. Such technologies provide the accessibility of these, thousands of learners struggling to read (Kořak-Babuder et al., 2018; Sofyan et al., 2021; Wood et al., 2018). The applications of the Read Along style can be seen as a representation of this constructivist approach, incorporating elements of guided support with learner freedom, i.e., allowing individual progress and reflection (Abdusalomova and Artikova, 2023; Shanthasheela et al., 2023).

Gamification can be described as the use of game features like points, progress bars, feedback, badges, and level-based systems in the context of the conventional learning process to improve learning interest and motivation. Reviews in the modern context indicate that gamification can be consistent with such basic motivational models as SDT and CLT, but it is not an independent strategy (Krath et al., 2021). The importance of gamified assessment is also highlighted in the articles by Hawari et al. (2020) and Jong et al. (2025) as the authors base their arguments on the literature and the analysis of the context stating that students would like to receive gaming-like assessment, which can promote an interactive learning environment (Khaldi et al., 2023; Triantafyllou et al., 2025). Well-structured gamified systems will cause the learning process to be visible so that practice can be divided into small units that can be accomplished and keep the attention of the learner active.

The potential of gamification as an intervention to improve the attitude of learners and the quality of their engagement in research studies is clear, in places where they are accompanied by providing immediate feedback and frequent cycles of practice (Khaldi et al., 2023; Rashid 2023; Triantafyllou et al., 2025). Smiderle et al. (2020) on the other hand noted that although some features like leaderboards can be used to encourage competitive learners in the meantime, they can simultaneously discourage others too. Also, in Khaleel et al. (2019) and Rashid (2023), problems, rewards and progress tracking affect the engagement and learning of students through gamification has delivered the evidence that gamification can produce similar positive changes to the engagement and motivation of a student, but it is specific to the discipline and most of their evidence comes through self-report measures as opposed to outcomes over time.

2.2 Google Read Along

Google Read Along is one of the examples of the intersection of AI, gamification and early literacy support. It involves listening a child read out loud and responding with an artificial intelligence powered character (Diya) to provide feedback on pronunciation patterns of words read incorrectly, which are also observed and give feedback on the correctly read words in the form of stars and badges, introducing game mechanics into the context of the structured reading practice (Abdusalomova and Artikova, 2023). The library of graded stories enables the learners to choose the texts at a level that fits them well and the system can adapt to the performance of the learner over time providing a form of adaptive reading instructions (Shanthasheela et al., 2023). It was stated in the review of Google Read Along in the proceedings paper published by Syazwani and Syafiqah (2024) that reading pronunciation and fluency with the incorporation of the app demonstrated positive results of the research. The technology therefore is a stimulant in the improvement of ESL reading literacy as opposed to the traditional approach.

There is chance of evidence about rural Malaysian primary schools and they tend to improve more in terms of both reading accurate and reading fluency in using Google Read Along as an addition to regular instructions than those that simply rely on conventional classroom activities (Shanthasheela et al., 2023; Syazwani and Syafiqah, 2024). Such learners also indicate that they are having more fun, feel more confident and willing to read on their own, citing the interactive feedback of the app, rewards and story-based learning (Shanthasheela et al., 2023; Abdusalomova and Artikova, 2023). These observations can be supported by the general studies on AI enhanced, differentiated learning, which theorises that AI devices can individualize learning and support among different learners as well as provide them with multimodal input and practice opportunities out of school (Jong et al., 2025; Yulianti and Saputri, 2024).

Simultaneously, the extension of Google Read Along into actual classrooms also presents well-known issues of infrastructure and teacher preparation and balance. The application of devices, reliable connectivity and technical support determines the use of the app by learners, and it may not be evenly distributed in schools and families (Jong et al., 2025). Educators also need to determine how to synchronize activities on apps with curricular objectives, how to make sense of app information and how to integrate individual digital practice with group reading activities leading to comprehending higher order and being more critical of literacy. The results of AI research on Malaysian education point out that AI tools will be implemented poorly, and teachers might misuse AI without proper training and appropriate direction (Muhammed and Kamsin, 2025; Yong, 2025). Therefore, although Google Read Along has a potential to provide an impressive AI powered, gamified platform to facilitate ESL reading, the application of AI elements within pedagogy and learning must be done with consideration since it is context sensitive.

2.3 Past Studies on AI, Gamification and Reading Motivation in ESL

The role of AI and gamification in the ESL reading scenario has been demonstrated to provide adaptive, data motivated learning courses to give both adaptive feedback and differentiation to learners with varied abilities but keep them engaged. According to Gomez Niño et al. (2025), an AI-based gamified design can significantly support the motivation of the learners and the development of the 21st century competencies, in which gamification provides adequate motivation and skills development processes, and AI can maximize learning by means of personalisation and adaptivity. The use of intelligent tutoring systems among others, conversational agents and speech synthesis applications in reading instruction have produced promising results in terms of literacy development. Much of the empirical research has shown a positive impact of these technologies on the reading performance and interaction of ESL learners, with Musti, Smith and Begeny (2022), Abdusalomovand Artikova (2023) and Shanthasheela et al. (2023) reporting these positive effects, as well as Syazwani and Syafiqah (2024).

The results are supported by findings of gamification research indicating that motivational gains are best when the elements of a game are well-organized, sensitive to the performance of learners as well as cognizant of the instructional goals (Krath et al., 2021; Rashid, 2023; Syazwani and Syafiqah (2024); Triantafyllou et al., 2025). Recent articles by Jong et al. (2025), Matrafi and Almuhammadi (2025) and Rashid (2023) further elaborate that gamified environments should be used to increase participation and persistence and models like extended flipped classroom will redistribute the time available in the classroom to communicative and interpretive practice to keep the learner interested (Diningrat et al, 2023).

Based on research carried out by Gomez Niño et al. (2025), Muhammed and Kamsin (2025) have reached a comparable conclusion that AI-based gamification is ideal when it is supervised by well thought lesson guideline and not relying on the technology. In this way, professionals may employ technology to enhance the learning process in the learner and establish a stress-free learning

experience (Abdusalomova and Artikova, 2023; Shanthasheela et al., 2023; Yong, 2025). Nevertheless, as mentioned by the researchers, the outcome may vary significantly based on the participants, the tasks performed, and the classroom learning environment (Delgado et al., 2018; Fahandezh and Mohammadi, 2021; Jong et al., 2025), and further classroom-based research is required to observe the impact of AI and gamification to improve ESL reading in primary school.

METHODS AND MATERIALS

3.1 Research Design

The research takes the form of an experimental pretest-posttest research design using quantitative and qualitative data, which is in line with the definition of experimental research presented by Creswell (2014), who views the purpose of experimental research to be to test the effect of an intervention by comparing the measurements before and after the intervention (Creswell, 2014). To assess the impact of the intervention, the process of reading proficiency and engagement is quantitatively measured by assessing test scores and records of gaming on Google Read Along before and after the intervention. Semi structured interviews are employed qualitatively to get rich and descriptive accounts of the experiences of learners such that numerical findings can be enrichments to subjective thoughts of the learners by Creswell who states that qualitative and quantitative data help in strengthening interpretations in education intervention research (Creswell, 2014).

3.2 Sample of Population

The sample will comprise of 30 ESL students (aged 11) selected in 3 classes in a primary school in Kuala Terengganu, Terengganu. The groups that are going to be used in the study will be selected by purposive sampling as often purposive sampling will be used to identify classes that are already using Google Read Along, and the following criteria will be applied: parental consent, completion of the pretest and regular attendance of school, according to Creswell, intervention studies will clearly specify the population and sampling procedures (Creswell, 2014).

Table 1. Criteria of Participants

| Criteria | Description |
|--------------------------------|---------------------------------|
| Age | 11-year-old |
| Sex | Varied from male and female |
| Class | Varied from 3 classes in Year 5 |
| English language understanding | Low to mid |

3.3 The Research Instruments

Accordingly, this research will be an experimental pretest post-test study to investigate how Google Read along as an intervention affects reading success and motivation. The combination of numerical and narrative data usage is in line with the current mixed method intervention research that aims to know not just whether an intervention is effective or not, but also how and why an intervention may affect young learners' engagement rates, especially those of STEM or literacy-related situations. (Fàbregues et al., 2023).

In the intervention, the learners have a duration of eight weeks, in which they go through Google Read Along in 30 minutes sessions, three days a week. Google read along is used to report significant

improvements in reading after one reads text as an activity that takes place in a library to decode and become more proficient, recover vocabulary, literal and inferential comprehension and non-linear texts (Capodieci et al., 2020; Diningrat et al., 2023; Musti et al., 2022; Shanthasheela et al., 2023). Gamification features are integrated to facilitate the motivation and involvement such as the receipt of points when one reads correctly. The inclusion of badges, having them on mastering vocabulary and a weekly updated leaderboard to encourage friendly competition among students (Alhalafawy and Zaki, 2022; Fahandezh and Mohammadi, 2021; Khaldi et al., 2023; Khaleel et al., 2019; Smiderle et al., 2020; Wook et al., 2021). This design can be considered in line with the recent contributions, indicating that gamized environments in reading may be used to facilitate the attainment of measurably positive progress in reading performance and motivation results when game mechanics, learning goals, and evaluation indicators are well-balanced (Krath et al., 2021; Triantafyllou et al., 2025; Wang et al., 2024).

It is essential to conduct surveys on motivation to read after the conducted intervention session (Bakkaloğlu and Pilten, 2023; Wang et al., 2020; Wigfield et al., 2016). All the questionnaires were made in English to Malay in a bilingual way. It is indicative of the lingual profile of the learners since they are Malay-dominant ESL-users and to reduce the error of language input and proficiency. The objects of the first language of the learners will serve to make sure that the responses are based on their actual motivation to read and perceptions of the Google Read Along activities and not on their capacity to interpret English-only objects, which is in line with the guidelines based on cross-cultural adaptation and the necessity to consider the medium of reading and language in the interpretation of the comprehension and self-report information (Beaton et al., 2001; Delgado et al., 2018; Wood et al., 2018). The use of bilinguals in administration of multilingual assessments has been discussed to create fairness and increase validity in learners among them (UIL & APCEIU, 2019; UNESCO, n.d.).

3.4 Data Collection Procedures

Pre and posttest reading scores of the learners are quantitative data used to determine the improvement and relative gain of the learners. The motivation to read is measured by 10 item survey with 5-point Likert scale, in which strongly agree to strongly disagree, based on the set of existing tools to measure reading motivation intrinsic and extrinsic, reading amount and reading strategy as predictors of reading success (Wang et al., 2020). Means, standard deviations, and a general motivation scale of the learners are calculated to characterize the learner motivational profiles, as was done in earlier motivation-reading achievement (Bakkaloğlu and Pilten, 2023; Wang et al., 2020; Wigfield et al., 2016).

Qualitative data is gathered by the means of semi structured interviews with five sampled respondents, their enjoyment, struggle and perceived advantages of using gamified digital reading application. The self-report survey and interview will contain a translation, back translation which is advisable by Beaton, Bombardier, Guillemin and Ferraz (2001) in order to guarantee linguistic and cultural suitability to the local context.

3.5 Data Analysis

The descriptive statistics (mean, SD, relative gain), paired samples t-test allow comparing pre and posttest reading scores to analyse quantitative data as outlined by Creswell in his recommendations on how to analyse data in an experimental and quasi experimental research (Creswell, 2014). The significance and magnitude of intervention effect and motivation survey data are determined with the help of P-values and effect sizes and item means and standard deviations are used to summarise the data of the analytical strategies that are typically used in the study of reading motivation, reading amount, and reading achievement (Wang et al., 2020).

Qualitative information from interviews is transcribed and open to thematic analysis, which is succeeded by Braun and Clarke with six steps of familiarisation, coding, theme development, review, definition and reporting in which the patterns of engagement, motivation and perceptions toward the gamified reading experience of the learners are discovered (Braun and Clarke, 2006). It is a type of analytical process that allows the researcher to be able to transition between the descriptive codes and more construal themes that clarify how learners study the gamified reading intervention through real life (Braun & Clarke, 2006).

RESULTS AND DISCUSSION

4.2 Findings

4.2.1 Pretest posttest

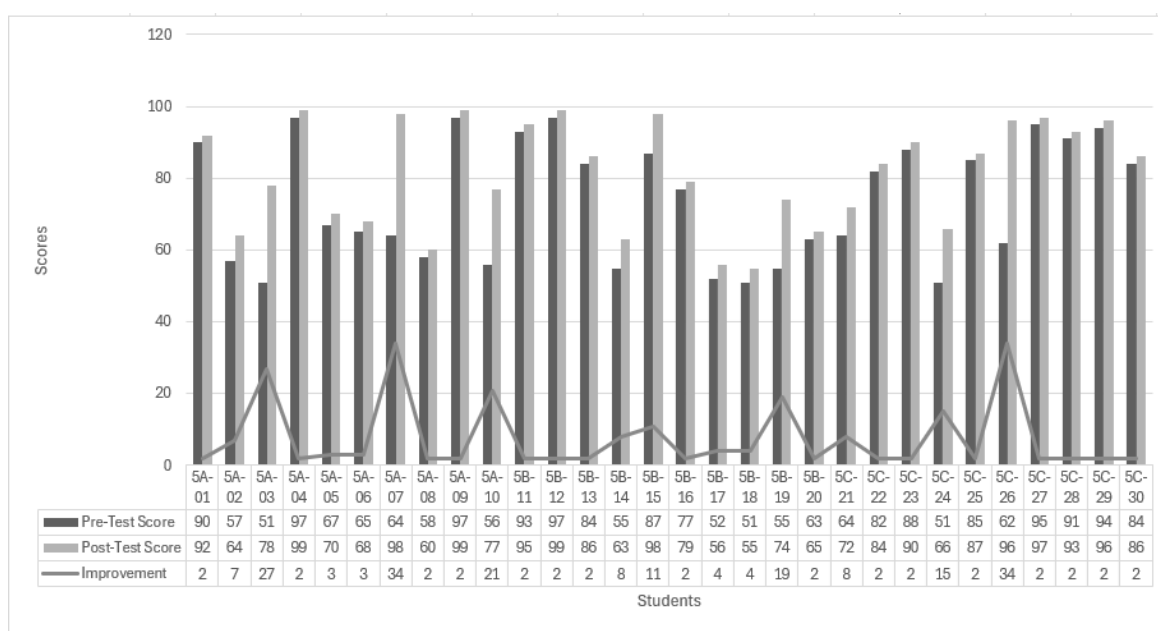


Figure 1. Pretest Posttest and Improvement in Score

The pretest and posttest outcomes in Figure 1 revealed significant positive changes on reading performance of learners in both group and individual levels happening when they received gamified digital reading intervention. The average scores improved to 81.40% on the post-test compared to 73.73% in the pretest with all 30 learners scoring more points after the intervention with a range of 2 to 34 points. This trend suggested that the intervention was overall effective with the entire class and the weaker readers achieved significant improvement with the stronger readers also achieving significant improvement but still lesser.

On the individual level, a very good example of such enhancement was offered by learner 5A-03 in Figure 1 where he improved in terms of pretest and posttest scores by 27 points (Figure 1). This level of increase showed how the gamified nature might have helped learners with weaker initial reading accomplishments to achieve greater engagement, practice and confidence levels. These gains at the learner level, when taken together with the statistically significant overall increase, and medium-large effect size, supported the conclusion that the intervention produced a positive and educationally significant effect on the reading results of learners.

Table 2. Pre-Test and Post-Test Reading Scores, Gain and Effect Size for Primary ESL Learners

| Statistic | Pre-test | Post-test | Change |
|--------------------|----------|-----------|--------------|
| Mean (%) | 73.73 | 81.40 | +7.67 |
| SD (%) | 14.77 | 13.67 | — |
| Relative gain (%) | — | — | +10.40 |
| Paired t (df = 29) | — | — | 4.34 |
| p-value | — | — | 0.00016 |
| Cohen's dz | — | — | 0.79 |
| Learners improved | — | — | 100% (30/30) |

Table 2 of the inferential statistics demonstrated that the gains in reading scores were highly unlikely to have arisen solely due to the chance factor. The paired-samples t-test directly compared the pretest score of each individual learner with his or her post test score hence eliminating individual variation in baseline reading ability and emphasizing the change in the same learners over time. The resultant $t(29) = 4.34$ and the $p\text{-value} = 0.00016$ showed that the likelihood of having attained a mean gain of 7.67 percentage points through pure random fluctuation was very minimal much less than the standard levels of significance of 0.05 or even 0.01 in education studies. On the practical level, this constituted a strong statistical data that the intervention was consequent to the real gains in the reading performance as opposed to the random change in the test results.

Table 2 providing the effect size provided an additional understanding of the strength of this improvement. The Cohen d_z value of 0.79 also reflected a medium to large effect, as it was the case that the average learner on post test score was significantly higher than post test score meaning that it is a significant difference in an educational setting. Such a size of effect suggested that the intervention had larger than a small or trivial effect; rather, it had significant magnitude of change in reading outcomes in learners that would probably be discernible in classroom practice. Also, the fact that the standard deviation decreased by a small margin by 14.77 at pretest to 13.67 at post-test indicated that the performance of the learners slightly became more consistent and that the learners who scored lower caught their scoring counter groups. Such trend indicated a reduction of the achievement gap of the class and was an indicator that the intervention was helping stronger and weaker readers although the balance of the scores was significantly smaller in those who began at a lower level.

4.2.2 Reading Motivation Survey

Table 3. Result of Reading Motivation Survey

| Survey Question | Strongly Disagree (1) | Disagree (2) | Not Sure (3) | Agree (4) | Strongly Agree (5) |
|--|-----------------------|--------------|--------------|-----------|--------------------|
| I enjoy reading storybooks. <i>Saya suka membaca buku cerita.</i> | 2 | 4 | 5 | 12 | 7 |
| I am interested in the topics I read about. <i>Saya gemar membaca berkenaan tajuk yang disukai.</i> | 1 | 3 | 6 | 13 | 7 |
| I like to read about new things. | 1 | 2 | 4 | 15 | 8 |

continued

| | | | | | |
|--|---|---|---|----|---|
| <i>Saya suka membaca perkara baru.</i> | | | | | |
| Reading helps me get good grades in school. | 0 | 3 | 5 | 14 | 8 |
| <i>Membaca membantu saya mendapat gred yang baik di sekolah.</i> | | | | | |
| I like it when my teacher says I am a good reader. | 2 | 4 | 6 | 12 | 6 |
| <i>Saya suka apabila cikgu saya mengatakan saya seorang pembaca yang baik.</i> | | | | | |
| I like reading books that make me think hard. | 3 | 5 | 7 | 10 | 5 |
| <i>Saya suka membaca buku yang membuat saya berfikir dengan mendalam.</i> | | | | | |
| It's important for me to be a good reader. | 0 | 2 | 6 | 13 | 9 |
| <i>Adalah penting bagi saya untuk menjadi seorang pembaca yang baik.</i> | | | | | |
| I like to talk to my friends about books. | 4 | 6 | 8 | 8 | 4 |
| <i>Saya suka berbincang dengan rakan-rakan saya tentang buku.</i> | | | | | |
| I don't like reading difficult text. (Reverse-coded) | 6 | 8 | 7 | 5 | 4 |
| <i>Saya tidak suka membaca teks yang sukar.</i> | | | | | |
| I'm a good reader. | 1 | 3 | 8 | 12 | 6 |
| <i>Saya seorang pembaca yang baik.</i> | | | | | |

Table 3 results of the reading motivation survey revealed that the majority of the learners had rather positive attitudes towards reading in most of the dimensions that comprised readings, which included enjoyment, interest, perceived usefulness, self-beliefs/social aspect of reading. It can be seen that, on a number of things, a large number of the learners selected the option of Agree or Strongly Agree which means that reading was regarded to be a favourable activity to most of the learners at the class.

To have fun and interest as displayed in Table 3 19 learners repeated that they liked reading storybooks (12 agreed, 7 strongly agreed, 6 disagreed, 5 were not sure) which indicated reading storybooks was positively accepted by the majority of learners. Likewise, 20 learners responded with an agreement or strong likelihood of agreement (13 "Agree, 7 Strongly Agree) that they were interested in what they were reading on the topic and this once again had a small group responding with disagreement or uncertainty which indicated overall fairly high topic related interest. The mode of

positive responses was the greatest in I like to read about new things, 23 learners responded positively or strongly (15 Agree, 8 Strongly Agree), which implies a great interest in new information and motivation to work with it.

The responses were also strongly positive to make Table 3 useful and valuable to read. The 22 learners answered in agreement (14 said agree), and strongly agreed (8 said strongly agree) to the statement Reading helps me get good grades in school and no one responded to the statement strongly disagree indicating that almost every learner was aware of the academic value of reading. Similarly, 22 respondents confirmed agreement or strongly agreeing on the fact that it was important to them to be a good reader (13 agree, 9 strongly agree), as compared to only 2 disagreements with 6 neutral, meaning that most of them had personal opinions about the importance of being a good reader.

Then, as concerns self-perceptions and teacher feedback, the answers point to moderately high positive self-beliefs. Table 3 in I like it when my teacher says I am a good reader demonstrates that teacher recognition means a lot to most learners (18 said that they agree or strongly agree 12 agree and 6 strongly agree) but there were 6 learners who doubted anything and 6 learners who strongly disagreed with that statement. In case of I'm a good reader, 18 learners could agree, or strongly agree (12 agree, 6 strongly agree), 4 disagree and 8 not sure, which means that most learners thought themselves as good readers but few were not so sure with their ability to read.

In Table 3, the pattern was partial in the case of cognitive challenge and social aspects of reading. On I like reading books that make me think hard, 15 students responded Agreement or Strong Agreement (10 Agreement, 5 Strong Agreement) but 8 disagreement or Strong disagreement and 7 Not sure indicating that many students were willing to read harder books, however, it is possible that a significant number preferred less challenging reading. Socially, the item I like to discuss books with my friends had the lowest degree of endorsement: only 12 learners were able to agree or strongly agree to it (8 Agree, 4 Strongly Agree) and 10 disagreed and strongly disagreed, and 8 were not sure, and so it was not yet a strong activity that many learners engage in as part of the reading experience.

The reverse coded item listed in Table 3 "I do not like reading hard writing provided more insight on the responses of the learners to challenge. In this case 14 learners chose Strongly Disagree or Disagree (6, 8 respectively), 7 Learners were Not Sure and 9 indicated Agree or strongly agree (5, 4 respectively). Prior to reverse coding, this trend indicated that a large group of people did not support the fact that they disliked tough texts but rather the next category was uncertain or affirmed that they did dislike tough texts; however, disagreement with this assertion was positively correlated with the average score in motivation, in the end, after reverse coding.

Based on the results in Table 3, the surveyed results revealed that the learners expressed quite positive and mixed motivation towards reading, especially in accordance to the interest in new and personally relevant reading materials and the clear understanding of reading as a key to succeeding in a school and as a successful reader. Most of the learners also considered themselves good readers and appreciated the praise by the teacher, but not all of them knew exactly their level of competence and readiness to read the difficult texts and discuss books with peers was more inconsistent. These trends indicated that, though the course or the subject was well-grounded in terms of enjoyment, interest and value were laid on reading.

4.2.3 Interview Insights

Table 4. Participants Response

| Participant | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|-------------|-----------------------|---------------------|-----------------------|------------------------|-----------------------|---------------------------|-----------------------|-------------------------|--------------------|------------------------|
| P1 (Male) | Sometimes, worried | Comics, pictures | At home, after school | Reads more smoothly | Correct pronunciation | Reading feels like a game | Wants more stars | Internet & DELIMa login | Prefers app | Wants more school use |
| P2 (Female) | Few times/weeks, okay | Storybooks, animals | Evening, with mother | Reads confidently | Voice correction | Fun and enjoyable | Happy with badges | Mic detection | Prefers app | Wants more stories |
| P3 (Male) | Almost never, bored | Comics only | In school | Reads simple sentences | App corrects mistakes | Not boring anymore | Motivated to level up | Shy to read aloud | Prefers app | More confidence |
| P4 (Female) | Every day, happy | Storybooks | At home, before bed | Better pronunciation | Word explanation | Interactive | Excited by rewards | Internet dependency | Both (app helpful) | Enjoys app |
| P5 (Male) | Sometimes, okay | Superhero comics | At home, phone | Reads faster | Learns new words | Happy reading | Wants more stars | Battery & app crash | Prefers app | Wants more teacher use |

Table 4 of semi structure interviews were conducted in 1014 August 2025 and these interviews yielded very deep information on how ESL students read with the help of the Google Read Along reading tool under the DELIMa platform. Before the programme was realised, most learners revealed that they were not engaged in reading English extensively and that they had negative attitudes towards the process like worry, boredom, or lack of confidence. One of the learners that stated one of the reasons in Table 4 described that, I almost never read English books because I feel bored, and it is difficult (P1, 10 August 2025, 08:1213), whereas another one stated that I never read an English book because I feel boring and it is hard (P3, 12 August 2025, 10:1710:18). The responses reveal that using the Google Read Along program made the reading of English appear demanding and less interesting.

The interview data in Table 4, based on the five respondents showed that the reading application was usually rated to be useful in confidence development, reading fluency, and enjoyment. As an example, at the start of the interview conducted on 10 August 2025 (10 August 2025, 08:12–08:18 a.m.), P1 said that he reads at times worried, but later in the session, he said that he reads fluently after using the app (10 August 2025, 08:2631 a.m.). In like manner, in her interview in 11 August 2025, P2 went as far as to say that she did not read due to the app, switching her phrasing to reading confidently with the app (11 August 2025, 09:2749:33 a.m.). On 14 August 2025, P5, who was interviewed, also noted that he reads faster with the help of the app (14 August 2025, 10:4210:47 a.m.). The consonance of the reports indicates that the app decreased anxiety in reading and facilitated more fluent reading throughout the period of the interview.

Table 4 participants also highlighted the overall experience of reading with the app as better and more enjoyable and the game compared to what they did in the past with printed texts. In the interview with P3 on 12 August 2025, he compared his previous claim that he did not read at all because it was boring in his view (12 August 2025, 08:1908:24 a.m.), to a later comment that he no longer found such reading, by way of the app, to be boring and said instead that it was interactive (12 August 2025, 08:4108:47 a.m.). P2 characterized the reading session as fun and enjoyable and said that she felt happy with the badges when she talked about the reward system (11 August 2025, 09:4811:55 a.m.), and both P1 and P5 added that they want more stars during their sessions (10 August 2025, 08:4408:49 a.m.; 14 August 2025, 11 11:03-01.08 a.m.). In addition to this, P4, who was interviewed on 13 August 2025, stated that she was part of the group that was excited by rewards and that she was compelled to

level up (13 August 2025, 10:1610:23 a.m.). These time stamped messages indicate that the gamified features were always keeping the learners engaged since the time they commenced the interview schedule.

The interviews also demonstrated the way that the participants integrated the app into their everyday reading habit and what contextual or technical aspects influenced their usage. P1 said that he usually read comics in the app at home after school (10 August 2025, 08:3210:38 a.m.), whereas P5 said that he read superhero comics in the app at home, phone (14 August 2025, 10:3010:36 a.m.). P2 said that she usually read storybooks with mother when they were back at home in the evening (11 August 2025, 09:18–09:24 a.m.) and P4 claimed to like to read storybooks at home before bed in simple storybooks (13 August 2025, 10:0310:09 a.m.). It coincides with the sentiments by Vygotsky which held that social interaction and cultural tools scaffold learning (Vygotsky, 1978). Nevertheless, other participants also provided the practical limitations during the interview: P2 mentioned the problem with the internet and DELIMa login that could sometimes refuse to grant the access (11 August 2025, 10:1410:21 a.m.), P3 had an issue with mic detection (12 August 2025, 09:33 9:39 a.m.) and P5 had a problem with battery and app crash (14 August 2025, 11:3411:40 a. These particular cases demonstrate that the effectiveness of the intervention process based on reading materials during the period between 8:00 a.m. and 12:00 p.m. relied partially on the stable technical conditions.

Throughout the period of the interview (10-14 August 2025), each of the five participants reported mostly positive attitude towards the app and strong anticipation of further usage. P1, in the final part of his interview on 10 August 2025, stated that he likes the app and would love to see more of it used in schools to enable teachers to incorporate it into lessons (10 August 2025, 09:4110.48 a.m.). P2 (interviewed on 11 August 2025) also stated that she might use the textbooks but the app proved to be more useful; it was very helpful reading out loud and she only wished that more of the stories could be found (11 August 2025, 10:2510:32 a.m.). P3 also stated that he prefers the app and that he would like to see the teacher use it more often (12 August 2025, 09:4410:50 a. m.), and P4 on 13 August 2025 told him that she will feel more confident about the use of the app after using it more regularly (13 August 2025, 10:2710:34 a. m.). P5 who was interviewed on 14 August 2025 affirmed that he liked the app and that both independent and teacher guided sessions proved to be useful (14 August 2025, 11:4511:52 a.m.). The comments of these consecutive dates illustrate that throughout the entire interview schedule of 8: 00 a.m. -12: 00 p. m over five days, the app was well received and that learners were looking forward to more integrated application and increased content in further teaching and learning lessons.

In sum, the results of the interview reveal that Google Read Along influenced the learning skills, motivation, and confidence of the learners positively. Once again, the respondents were happy with the application and wanted to use it in a classroom and home environment. One student made a statement, I am glad I use this application and I would like my teacher to use this application in the classroom more often (P5, 14 August 2025, 11:52-11:53), another one stated, I feel that I can read English now and I want my teacher apply this application more often in the classroom (P3, 12 August 2025, 10:38-10:39). Such findings indicate that Google Read Along could be an effective tool in boosting the learning of English reading in learners in primary schools.

The results of the current paper show that the digital reading gamifier Google Read Along has the potential to affect the primary ESL students positively through their reading performance and motivation in the classroom when applicable to the everyday practice (Abdusalomova and Artikova, 2023; Wang et al., 2024). The large pre-post effect and medium to large effect size are reinforced by previous studies that reveal that the intervention powered by technology can effectively improve reading results, especially when they involve structured practice, feedback and scaffolding (Capodiecici et al., 2020; Musti et al., 2022).

It is in line with the literature that shows how different gamification methods, such as points, badges and leader boards, can be used as part of English language learning to encourage young learners to engage in activities with increased attention and persistence (Abdusalomova and Artikova, 2023; Wang et al., 2024). Resting on the current evidence, the existing data promotes the idea that the proper use of digital tools can become an addition to the traditional instruction in the Malaysian context, in which reading difficulties in English are still one of the troubles, and gender and proficiency equality is still a topical concern (Badrasawi and Abu Kassim, 2020; Chandran and Shah, 2019; Jain and Othman, 2019).

Based on the results, the effect sizes of the post-test to the pretest reading scores were medium to large. These benefits complement the previous research in digital reading and virtual tutoring (Capodiecici et al., 2020; Musti et al., 2022). According to the shrinking gap between the weaker and stronger readers, it is beneficial to the learners with lower initial abilities (Kořak-Babuder et al., 2018; Wood et al., 2018). The data regarding both motivational and the interview records of the learners also confirm the significance of paying attention to reading motivation as a significant aspect of reading development as opposed to considering cognitive skills alone (Wigfield et al., 2016). The overall positive motivation profile that is identified in the study is relevant to studies that indicate that reading motivation has been closely associated with reading comprehension, self-efficacy and the volume of reading that learners intend to engage in (Bakkalođlu & Piltten, 2023; Wang et al., 2020; Wigfield et al., 2016).

Previously existing studies have emphasized on intrinsic and extrinsic motivation and self-motivation in regard to reading. Therefore, reading and achievement areas are both clear in the focus that interventions need to promote not only development of skills but also self-confidence and interest towards reading among learners (Wang et al., 2020). This point of view is reflected in the present results: the explanation of the learners that they feel more confident, less anxious, and readier to read after applying the app indicates that the combination of gamified rewards and corrective feedback on accessible texts could move the affective attitude towards reading English in a positive direction (Abdusalomova and Artikova, 2023; Shanthasheela et al., 2023).

The qualitative data that learners found the read-aloud, pronunciation and feedback features of the app useful are consistent with the body of literature on technology integrated reading support. Research on read aloud tools and text-to-speech technologies demonstrated that oral presentation of text and supportive feedback could improve performance and understanding, especially among those learners that are not also good decoders or those that have reading related challenges (Kořak Babuder et al., 2018; Sofyan et al., 2021; Wood et al., 2018).

CONCLUSIONS

Based on the research, it can be stated that an AI-assisted and games-based reading app could positively improve reading performance and help more Malaysian ESL primary ESL learners to have more positive reading experiences in parallel. The learners gave positive feedback to the fact that the feedback was immediate, there was an opportunity to re-read the same material, and the fact that it took the form of a game and that they found these features very enjoyable and helpful in making them feel confident in reading. Meanwhile, the lack of devices, connectivity and accent recognition underpin that even with visible beneficial effects of such tools, their efficacy heavily relies on proper infrastructure, school-wide organisation and long-running teacher assistance.

Its results indicate several practical applications in the classroom. Gamified reading applications such as Google Read Along can become part of a designed reading curriculum to offer specific techniques in fluency, pronunciation and vocabulary training, especially for those learners, who

feel anxious about reading aloud or the learners who fall behind their peers. Teachers who combine frequent, brief sessions using apps with remedial comprehension, discussion and writing experiences, will be able to enjoy the motivational power of game mechanics and, nonetheless, be able to focus on more advanced reading skills and curriculum outcomes. The stories in which learners continue to use the app at home indicates that Google Read Along can become useful in relating lessons in reading at school with the literacy practice outside of school.

The findings, however, also point to some areas of relatively poor reading motivation and reading practice that include the interest in more demanding texts displayed by learners and their readiness to discuss what they read among peers. To fill these gaps, individual gamified reading is to be supplemented by collaborative tasks, like book talks, partner discussions, and small-group tasks, such that Google Read Along would be distinctly linked with how the learners can achieve their reading goals.

The research is limited by several weaknesses. The sample was quite limited and was selected based on one school, which limits the breadth of generalisation of the results to the rest of the regions, types of schools and learner groups. The eight-week period of the intervention, along with relying on the infrastructure, and accessibility of tools to learners, also implies that technical failures, including connectivity issues, problems with logins and microphones and the acceptance of accents by a receiver could have impacted the frequency and quality of the interaction of learners with the app and the results received.

Future studies ought to thus investigate gamified digital reading interventions involving larger and more variable samples in various contexts of Malaysia and contrast their results with the other existing methods of teaching reading. The longitudinal research is required to address the questions of the sustainability of the gains in the reading performance and motivation. The introduction of in-app analytics, example time on task, levels and error patterns progression, example would assist in determining the design aspects that are the most useful to various kinds of learners. To add more information, mixed methods design including classroom observations, teacher, parent and learners' viewpoints could provide further information on how gamified tools are incorporated in the actual ESL classrooms and how these would be cognized with the larger objectives of literacy building and global citizenship learning.

In general, the present study demonstrates that a gamified reading app with AI engagement can be utilized as a beneficial auxiliary tool to improve the reading results and motivation of the primary students of the Malaysian ESL language if it is used in well-equipped and well-designed classrooms. The results point to the fact that these tools are most effectively used as structured extensions of teacher-centred instruction providing focused practice in fluency, pronunciation and vocabulary and associated with meaningful comprehension, discussion and writing activities that may be transferred into the home. Simultaneously, the weaknesses of sample size, the school-based environment, the brief intervention period and the resources imply that the interpretation should be exercised cautiously and the scaling should be done carefully. The wider and more comprehensive and rigorous research is needed, both to confirm these observations and extend them further, and to illuminate how gamified online reading tools can be implemented in a sustainably effective way which improves not only the outcomes of literacy but also other educational goals.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest, whether financial or non-financial, that could be perceived as influencing the research, authorship, or publication of this manuscript.

AUTHORS' CONTRIBUTION

1. Nur Syazwani Nasir: Investigation, Data Curation, Methodology Formal Analysis, Writing – Original Draft Preparation, Visualization.
2. Dr. Nur Syafiqah Yacob: Conceptualization, Supervision, Writing – Reviewing and Editing.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of this study are available within the article and its supplementary materials.

DECLARATION OF GENERATIVE AI

During the preparation of this work, the author(s) used an AI-assisted writing tool (ChatGPT) to enhance the clarity of the writing. After using this tool, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication.

ETHIC STATEMENTS

This study involved human participants from primary school ESL learners. Ethical approval was obtained from the Ministry of Education Malaysia, Educational Policy Planning and Research Division. Approval was granted under reference number KPM.600-3/2/3-eras (24924). Written informed consent was obtained from the learners' parents/guardians, and assent was obtained from the learners prior to participation. Participation was voluntary, and data were anonymised to protect confidentiality.

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