SEMARAK ILMU PUBLISHING

Semarak International Journal of Innovation in Learning and Education

Journal homepage:
https://semarakilmu.my/index.php/sijile/index
ISSN: 3030-5497

I-SaBoBa Module: An Innovative Intervention for Enhancing Malay Reading Skills among SJKT Preschool Children

Arulmozhi A/P Narayanasamy[1], Anis Norma Mohamad Jaafar[1,*], Anisaturrahmi[2]

[1] Pembangunan Manusia, Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia
[2] Faculty of Educational Sciences, Universitas Pendidikan Indonesia, Jawa Barat, Indonesia

ARTICLE INFO

Article history:
Received 15 July 2025
Received in revised form 29 August 2025
Accepted 15 September 2025
Available online 29 September 2025

Keywords:
Malay reading skills; preschool children; digital learning module; non-native speakers

ABSTRACT

Mastery of reading skills in the Malay language during preschool is essential for academic success in Malaysia. However, non-native speakers consistently demonstrate significant deficiencies in this area. This gap persists despite preschool attendance, suggesting a lack of adequate pedagogical resources tailored to their needs. Consequently, this study evaluates the effectiveness of the innovative I-SaBoBa module, developed using the Analyze, Design, Development, Implementation, and Evaluation (ADDIE) model and incorporating digital elements such as augmented reality and interactive games, in enhancing Malay reading proficiency among preschool children in Sekolah Jenis Kebangsaan Tamil (SJKT). A quantitative methodology employing a quasi-experimental design with pre-test and post-test measurements was utilized. The study involved 64 preschool children from (SJKT), equally divided into control and treatment groups of 32 participants each. Data analysis was conducted using Analysis of Covariance (ANCOVA) to control for pre-existing differences between groups. The results demonstrated significant differences between treatment and control groups across all measured aspects, with p-values of 0.00 ($p < 0.05$) for all hypotheses tested. All null hypotheses were rejected, providing strong empirical evidence of the I-SaBoBa module's effectiveness in enhancing the pronunciation of vowels and consonants, sounding KV syllables, word reading, and sentence reading skills. The study concludes that the I-SaBoBa module serves as an effective teaching and learning tool for Malay language reading skills in preschool education. This innovative intervention offers systematic and structured approaches to reading skill development, particularly benefiting non-native speakers, supporting Sustainable Development Goal (SDG) 4.6, and contributing to Curriculum 2027 targets, emphasizing foundational literacy mastery.

1. Introduction

Foundational literacy skills are universally acknowledged as the cornerstone of academic success and lifelong learning, with the preschool period identified as a critical window for their development. In the Malaysian context, proficiency in the Malay language is a national educational priority and

* *Corresponding author.*
E-mail address: anisnorma@fpm.upsi.edu.my

https://doi.org/10.37934/sijile.7.1.110

essential for social integration and future academic achievement. Furthermore, the Malay language must be learned by all preschool children [1]. However, recent assessments and scholarly reports have indicated a concerning gap in the reading skills of non-native Malay speakers in primary schools [2,3]. A study by Marimothu [4] demonstrated that Indian students from Sekolah Jenis Kebangsaan Tamil (SJKT) face difficulties in mastering the Malay language during the transition to secondary school. This situation often causes them to face challenges in understanding and following the curriculum taught in that language. This situation has a negative impact on students' academic achievement and weakens their self-confidence and motivation to learn. Yueh Wei and Lambri [5] have also emphasized that reading skills among non-native speakers in schools are often poorly mastered, thus contributing to the very significant dropout issue.

Although most of these children have completed preschool, they continue to encounter difficulties in mastering Malay reading skills. This ongoing challenge highlights a significant gap in the existing pedagogical approaches and resources available at the preschool level. Conversely, the identified deficiency in the acquisition of reading skills underscores an urgent need for innovative, evidence-based, and culturally relevant pedagogical interventions specifically designed to address these challenges. Hussin and Mohd Basir [6] have studied the effectiveness of reading skills modules in preschool education and stated that the modules make significant contributions in strengthening reading mastery and proficiency among preschool students. Based on these findings, the provision of new teaching modules that are structured with appropriate learning strategies is urgently needed to support the enhancement of reading skills among preschool students.

To address this research gap, the I-SaBoBa module was developed as a targeted intervention. This module is available in both print and digital formats, ensuring that students do not only rely on printed modules at school, but also have the opportunity to follow online learning with parental support at home. The module is developed based on the principles of digital learning to adapt to the various learning styles of students. This approach aims to ensure that each student receives teaching that aligns with their individual intelligence and learning style. The I-SaBoBa module is designed to introduce creative, engaging, and digital learning-based activities, including the integration of Augmented Reality (AR) and digital games which aim to help students master reading skills effectively. Research conducted by Noraini [7] indicates that interactive augmented reality (AR) textbooks have the potential to significantly enhance motivation for learning Malay vowels among first-grade students. Furthermore, a study by Ahmad [8] demonstrated that an instructional aid kit integrated with augmented reality significantly improves the teaching and learning process of Malay figurative compound nouns. These findings collectively suggest that augmented reality technology has significant potential as an innovative pedagogical tool for enhancing various aspects of Malay language instruction, from foundational phonetic elements to complex grammatical structures.

In addition, this module also follows the phases of the ADDIE Model (Analyze, Design, Development, Implementation, and Evaluation) to ensure that it is carefully developed and can be evaluated for its effectiveness in helping preschool students master reading skills.

Figures 1 to 5 demonstrate the module website that has been developed, including the module usage guide, augmented reality, learning materials, and digital games found in the I-SaBoBa Module.

Fig. 1. Website image https://modul-i-saboba.com

Fig. 2. Picture of the module and augmented reality usage guide

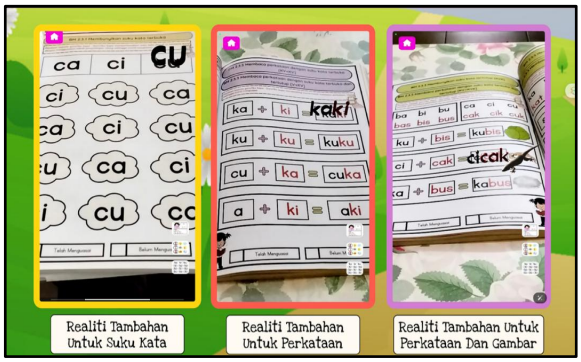

Fig. 3. Augmented reality example picture

Fig. 4. Picture of learning materials

Fig. 5. Digital game picture

2. Objective

The objective of this study is to examine:

i. To investigate whether there is a significant difference in the mean score in mastery of reading skills, specifically in the aspects of (a) pronouncing vowels and consonants, (b) sounding out KV syllables, (c) reading words, (d) reading sentences between the treatment group and the control group.

3. Methodology

This study applied quantitative methodology through a quasi-experimental research approach. According to Stangor [9], the quantitative research approach is characterised by systematic and

objective procedures in data collection, culminating in the organisation and presentation of data in numerical form. This approach prioritises systematic information gathering, enabling researchers to assess variables and analyse the relationships between independent and dependent variables. The primary objective of quantitative research is to clarify the results derived from the collected data, thereby offering insights that may reflect the broader population or context.

Chua [10] stated that quantitative research design includes the collection and analysis of numerical data through descriptive and inferential statistical methods. The main purpose of the quantitative approach used in this study is to evaluate hypotheses and investigate the relationships between the variables under study.

3.1 Quasi-Experimental Study

Quasi-experimental studies allow for a systematic and empirical evaluation of the module's effectiveness. A quasi-experimental design with control and treatment groups was used to assess the impact of the module on the reading proficiency of preschool students in SJK(T) before and after the intervention. The quantitative data collected provided scientific evidence of the impact of the module on enhancing reading skills, and this aspect is important to confirm the value and effectiveness of the module developed. This unequal groups pre-post test design is most often used in quasi-experimental research designs [10,11]. Therefore, researchers use unequal groups pre-post test designs. Table 1 demonstrates the quasi-experimental designs used through the implementation of pre-tests and post-tests.

Table 1
Quasi-experimental design for pre-test and post-test methods

Group	Measurement (Pre- Test)	Treatment	Measurement (Post – Test)
Control group	/		/
Treatment group	/	/	/

3.2 Demographics of the Study Sample

Table 2 presents a demographic analysis of the sample for this study, which includes several important aspects such as gender, age, race, and type of school. The data obtained provides a demographic picture for the purpose of the study. The collection of this demographic is important to ensure that the study can demonstrate a clear picture of the study population.

Table 2
Demographic analysis of the study sample

Demography		Frequency	Percentage
Gender	Girl	35	54.6
	Boy	29	45.3
Age	5 years old	15	23.4
	6 years old	49	76.6
Race	India	64	100.0
Type of school	Sekolah Jenis Kebangsaan (Tamil)	64	100.0

The determination of the sample size in this study was based on the recommendations presented by Idris [12] and Fraenke *et al*., [13]. According to them, a quasi-experimental study requires at least 30 samples for each group. Therefore, the researcher selected 32 samples for the control group and 32 samples for the treatment group. This number not only exceeded the minimum requirements but also provided a solid basis for conducting meaningful statistical analysis.

3.3 Instrument Pre and Post-test

Pre- and post-tests were used in this study to allow the researcher to measure changes in students' reading skills more accurately. According to Stratton [14], the pre- and post-test design is a form of quasi-experimental study that allows for the evaluation of interventions to be carried out without the complexity of a group of study samples. Cohen [15] stated that pre-tests administered at the beginning of the study can produce effects that are not solely due to the study treatment. Thus, the pre-test serves as a benchmark in identifying the initial level of reading skills of the study sample before the intervention is implemented, while the post-test is used to measure the extent of changes that occurred after the intervention period in the mastery of Malay language reading skills among the treatment group sample. This approach allows the researcher to identify the true impact of the I-SaBoBa Module on enhancing reading skills, considering the students' original reading skill level.

Using the same instrument for both tests ensures consistency in measurement and facilitates comparison of performance before and after the intervention. This step ensures that the data collected are consistent, thereby reducing the risk of measurement error and increasing the reliability of the results [16]. Consistency in the use of instruments allows for a more accurate assessment of intervention effects, as any observed changes in performance are due to the intervention itself and not from differences in the measurement instruments. In conducting this study, the researcher also took precautions to ensure a conducive and consistent learning environment for both groups. Although the treatment group received the intervention through the I-SaBoBa Module, the control group continued to follow the teaching sessions using the existing methods to ensure that students in the group did not lose learning opportunities throughout the study period. The pre-test and post-test designs are described in Figure 6.

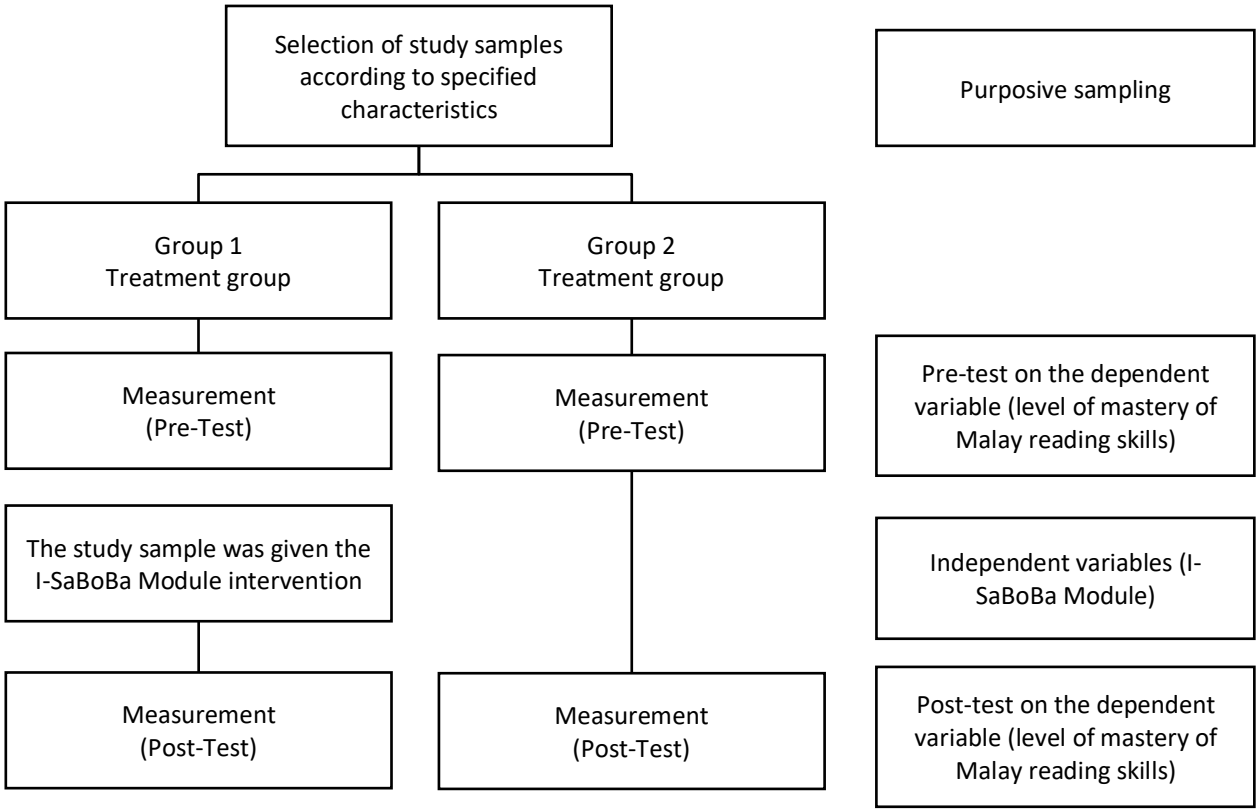

Fig. 6. Pre-test and post-test design

3.4 Hypothesis Testing

Research hypothesis testing was carried out to answer the research objectives. This process involved a detailed statistical analysis to identify whether there was a significant relationship between the variables under study. The research objectives and questions are described in detail in Table 3.

Table 3
Research objectives and questions

Research Objectives	Research Questions
Research Objective 1 To investigate whether there is a significant difference in the mean score in mastery of reading skills, specifically in the aspects of (a) pronouncing vowels and consonants, (b) sounding out KV syllables, (c) reading words, (d) reading sentences between the treatment group and the control group.	Research Question 1 Is there a significant difference in the mean score in mastery of reading skills, especially in the aspects of (a) pronouncing vowels and consonants, (b) sounding out KV syllables, (c) reading words, (d) reading sentences, between the treatment group and the control group?

Research hypotheses need to be tested empirically through appropriate testing methods to determine whether something is accepted or rejected based on the findings obtained in relation to the established research objectives. Research hypotheses are divided into two types of hypotheses, namely alternative hypotheses and null hypotheses.

According to Creswell and Creswell [17], the null hypothesis predicts that in the general population, there is no significant relationship or difference between groups in the variables being studied. Othman Talib [18] also stated that hypothesis testing is carried out to reach empirical

conclusions regarding the acceptance or rejection of the null hypothesis (Ho), which in turn allows the researcher to generalise to the study population based on the findings.

The null hypothesis is also a mechanism used to interpret data that has been collected for the purpose of statistical testing [19]. Therefore, the researcher chose the null hypothesis in this study. Table 4 explains the null hypothesis constructed in this study.

Table 4
Null hypotheses constructed in the study

Research Objectives	Research Questions
Ho1	There was no significant difference in the mastery of reading skills between the treatment group and the control group, especially in the aspect of (a) pronouncing vowels and consonants.
Ho2	There was no significant difference in the mastery of reading skills between the treatment group and the control group, especially in the aspect of (b) sounding out the KV syllable.
Ho3	There was no significant difference in reading skill mastery between the treatment group and the control group, especially in the aspect of (c) reading words.
Ho4	There was no significant difference in the mastery of reading skills between the treatment group and the control group, especially in the aspect of (d) reading sentences.

5. Results and Discussions

In the context of educational research, the ANCOVA (Analysis of Covariance) test is an effective statistical method to evaluate the effectiveness of a learning intervention such as the I-SaBoBa Module. Research designs can use the ANCOVA test to identify whether there is a significant difference between the scores of the treatment group and the control group. This test allows the researcher to control for existing differences among students before the intervention. By using pre-test scores as a covariate, ANCOVA can adjust the post-test results to account for different initial skill levels among students. This more accurately describes the true impact of the module, without being influenced by differences in students' initial mastery levels [10]. The results of the hypothesis testing are detailed in Table 5.

Table 5
Hypothesis testing

No.	Hypotheses	Analysis	Analysis Results	Summary
Ho1	There was no significant difference in the mastery of reading skills between the treatment group and the control group, especially in the aspect of (a) pronouncing vowels and consonants.	ANCOVA Test	Sig. value = 0.00 ($p < 0.05$)	There is a significant difference. So Ho1 is rejected.
Ho2	There was no significant difference in the mastery of reading skills between the treatment group and the control group, especially in the aspect of (b) sounding out the KV syllable.	ANCOVA Test	Sig. value = 0.00 ($p < 0.05$)	There is a significant difference. So Ho2 is rejected.
Ho3	There was no significant difference in reading skill mastery between the treatment group and the control group, especially in the aspect of (c) reading words.	ANCOVA Test	Sig. value = 0.00 ($p < 0.05$)	There is a significant difference. So Ho3 is rejected.

Table 5 (*Continued*)

Ho5	There is no significant difference in reading skill mastery between the treatment group and the control group, especially in the aspect of (d) reading sentences.	ANCOVA Test	Sig. value = 0.00 ($p < 0.05$)	There is a significant difference. So Ho4 is rejected.

The mastery of reading skills between the treatment group and the control group demonstrated a significant difference. Analysis using the ANCOVA test found that the significant value (sig.) was 0.00, which is $p < 0.05$. Nam [20] stated that all variables with $p < 0.05$ were considered statistically significant. Kim [21] also stated the same thing, that a p-value less than 0.05 was considered statistically significant. This proves that the null hypotheses (Ho1), (Ho2), (Ho3), and (Ho4) were rejected, indicating that there were significant differences in the aspects of pronouncing letters, sounding out KV syllables, reading words, and reading sentences between the two groups.

The first hypothesis (Ho1), which denied the existence of a significant difference in the mastery of vowel and consonant pronunciation skills between the treatment group and the control group, was tested using ANCOVA. The results of the analysis demonstrated a significant value of $p = 0.00$, which is lower than the set significance level ($p < 0.05$), indicating that there is a significant difference between the two groups. Therefore, the first null hypothesis was rejected, proving the effectiveness of the intervention in enhancing vowel and consonant pronunciation skills.

For the second hypothesis (Ho2), which focuses on the skill of sounding out the KV syllable, the ANCOVA analysis also demonstrated a significant value of $p = 0.00$. This finding was below the significant level ($p < 0.05$), confirming the existence of a significant difference between the treatment group and the control group. Therefore, the second null hypothesis was rejected, indicating that the implemented intervention had a positive influence on the skill of sounding out the KV syllable.

The third hypothesis (Ho3), which is related to the skill of reading words, demonstrated similar results with a significant value of $p = 0.00$. This result revealed a significant difference in the mastery of the skill between the two groups. Therefore, the third null hypothesis was rejected, and the effectiveness of the intervention on the aspect of the skill of reading words is consistently confirmed.

The fourth hypothesis (Ho4), which examines sentence reading skills, demonstrated consistent results with a significant value of $p = 0.00$, indicating that there is a significant difference between the two groups. Therefore, the fourth null hypothesis was rejected, providing strong evidence that the intervention successfully enhanced sentence reading skills among students in the treatment group compared to the control group.

Overall, the statistical analysis conducted using ANCOVA on all four hypotheses demonstrated consistent results with a significant value of $p = 0.00$ for all hypotheses tested. These results provide strong empirical evidence that the intervention implemented had a significant positive impact on the mastery of various aspects of reading skills, such as recognizing, pronouncing letters, and sounding out syllables, as well as more complex skills such as reading sentences. These findings support the conclusion that the teaching and learning approach applied in the intervention was effective in enhancing the mastery of reading skills in the treatment group study sample.

The findings of this study also support Sustainable Development Goal (SDG 4.6), as stated by Boeren [22], which is to ensure mastery of reading skills, as well as contribute to the achievement of the 2027 curriculum target [23], which emphasizes the importance of literacy mastery at level 1.

6. Conclusion

In conclusion, the results of this study demonstrate strong empirical evidence on the effectiveness of the I-SaBoBa Module as a tool for teaching and learning Malay language in the context of preschool education at SJK(T). This finding opens new opportunities in the approach to teaching reading skills, especially for non-native speakers. This module has not only proven to be effective but also offers a systematic and planned learning approach, aligning with the latest educational developments in developing basic Malay reading skills, which are an important aspect of lifelong learning. In line with current developments, the use of the I-SaBoBa Module in preschool education is one of the initiatives to strengthen the superiority of the Malay language and digital education. Therefore, the mastery of reading skills can be enhanced to a better level in the future.

Acknowledgements

This research was not funded by any grant.

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