DEVELOPING A GAMIFICATION-BASED INSTRUCTIONAL MODULE TO IMPROVE STUDENTS' READING COMPREHENSION

Syamsul Ma'arip
UIN SIBER Syekh Nurjati Cirebon, Indonesia
Email: syarifsyamsul60@gmail.com

Inayatul Ummah
UIN SIBER Syekh Nurjati Cirebon, Indonesia
Email: inayummah@uinssc.ac.id

Dadan Setiawan
UIN SIBER Syekh Nurjati Cirebon, Indonesia
Email: dsetiawan@uinssc.ac.id

ABSTRACT

Reading comprehension is a fundamental skill that influences elementary students' overall learning achievement; however, this ability often remains limited due to the use of less interactive teaching materials and teacher-centered instructional practices. This study aimed to develop a gamification-based teaching module and to examine its feasibility as well as its potential contribution to improving students' reading comprehension. The research employed a Research and Development (R&D) design adapted from the Borg and Gall model through seven stages. The participants consisted of 25 fifth-grade students of Sekolah Indonesia Kota Kinabalu (SIKK), Sabah, Malaysia. Data were collected through interviews, observations, tests, and documentation, and were analyzed using expert validation, the Wilcoxon signed-rank test, and N-Gain analysis. The validation results indicated that the developed module met highly feasible criteria in terms of media, language, and content aspects. In addition, the comparison of pre-test and post-test scores showed a statistically significant increase in students' reading comprehension, with an N-Gain score of 0.77 categorized as high. These findings suggest that the gamification-based module has promising potential to support students' reading comprehension and learning engagement. Nevertheless, the interpretation of effectiveness is limited to the current sample context due to the absence of a control group and the relatively small number of participants. Therefore, this module may serve as a relevant

instructional alternative in elementary Indonesian language learning, while further studies with broader experimental designs are recommended.
***Keywords**: Elementary School, Gamification, Instructional Module, Reading Comprehension*

How to Cite Ma'arip, S., Ummah, I., & Setiawan, D. (2026). Developing a Gamification-Based Instructional Module to Improve Students' Reading Comprehension. *Al-Mubtadi: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, *3*(2), 415–425. https://doi.org/10.58988/almubtadi.v3i2.1144

INTRODUCTION

Reading comprehension is a fundamental competency for elementary school students because it enables them to interpret information, construct meaning from texts, and support broader academic achievement. Beyond simple word recognition, reading comprehension requires students to identify key ideas, interpret explicit and implicit meanings, and synthesize textual information into coherent understanding (Sundari et al., 2023). This competency is closely associated with the development of critical thinking and problem-solving skills, both of which are essential for effective participation in classroom learning (Saharani et al., 2024).

Despite its importance, students' reading comprehension in elementary education remains problematic. Previous studies report that reading instruction is still frequently dominated by conventional teacher-centered approaches and monotonous teaching materials, limiting students' active involvement in constructing textual understanding (Muliawanti et al., 2022; Simbolon, 2023). In such learning environments, students tend to become passive recipients of information, which weakens their ability to analyze, infer, and summarize reading content meaningfully.

A number of recent studies have suggested that interactive and student-centered learning environments can positively influence reading comprehension.Nurbaeti et al., (2022) found that interactive learning significantly improves student participation, while Syajida et al., (2024) and Septiana et al., (2024) reported that technology-supported learning media increase students' interest and deepen text

understanding through more active engagement. These findings indicate that reading comprehension is not merely affected by students' linguistic ability, but also by the quality of instructional design that encourages cognitive participation during reading activities.

Within this context, gamification has emerged as a promising instructional approach. Gamification refers to the integration of game elements such as points, levels, challenges, and rewards into non-game learning settings to stimulate motivation, persistence, and active participation (Deterding et al., 2011). Empirical studies have shown that gamification contributes positively to students' learning motivation (Claritas et al., 2024), classroom engagement Novianti, (2024), and learning participation in reading-related tasks (Sultan et al., 2024). However, most of these studies position gamification primarily as a classroom strategy or digital activity to increase motivation and general learning outcomes.

Although the motivational benefits of gamification have been widely acknowledged, less attention has been given to its systematic integration into structured teaching materials specifically designed to foster reading comprehension processes. Existing studies rarely address how gamification elements can be embedded into an instructional module that explicitly guides students through essential reading comprehension indicators, such as identifying main ideas, locating explicit information, interpreting implicit meaning, and summarizing texts. As a result, the pedagogical function of gamification in supporting deeper textual understanding remains insufficiently explored, particularly in elementary Indonesian language learning contexts.

Addressing this limitation, the present study develops a gamification-based teaching module that systematically incorporates points, levels, and rewards into reading comprehension activities aligned with four progressive indicators: identifying main ideas, finding explicit information, interpreting implicit information, and summarizing text content. Rather than applying gamification merely as a motivational supplement, this study positions gamification as an instructional design component embedded within a structured learning module to facilitate students' cognitive interaction with texts.

Accordingly, this study aims to develop the gamification-based teaching module and to examine its feasibility as well as its potential contribution to improving elementary school students' reading comprehension. By focusing on the instructional product design and its alignment with specific reading comprehension indicators, this study is expected to extend the current discussion on gamification beyond student motivation toward its practical role in supporting meaningful literacy learning.

METHOD

This study employed a Research and Development (R&D) design to develop and evaluate the feasibility as well as the preliminary effectiveness of a gamification-based teaching module for improving students' reading comprehension. The development procedure was adapted from the Borg and Gall model (1984), which originally consists of ten stages. Considering the limited research scope and time allocation, the procedure was condensed into seven essential stages without neglecting the core developmental principles, namely: (1) research and information collecting, (2) planning, (3) developing the preliminary product, (4) preliminary field testing, (5) product revision, (6) main field testing, and (7) operational revision. The omitted stages mainly concerned large-scale dissemination and broader implementation, which were beyond the scope of this study. This adaptation was intended to maintain methodological rigor while ensuring the feasibility of classroom-based product development.

The study was conducted in Grade V of Sekolah Indonesia Kota Kinabalu (SIKK), Sabah, Malaysia. The participants consisted of 25 students selected through total sampling, as all students in the class were involved in the limited field trial of the developed product. Since the study focused on preliminary product testing within one instructional setting, the sample was intended to provide contextual evidence of feasibility and initial effectiveness rather than broad statistical generalization.

Data were collected through observations, interviews, tests, and documentation. Preliminary observations and teacher interviews were conducted to identify students' reading comprehension problems, classroom learning characteristics, and the need for more

interactive teaching materials. The test technique was administered in the form of pre-test and post-test to examine changes in students' reading comprehension after the implementation of the developed module.

The research instruments consisted of expert validation sheets and a reading comprehension test. The validation sheets were assessed by three expert validators covering media design, language appropriateness, and material relevance. Each aspect was rated using a five-point Likert scale to determine the feasibility level of the developed module. Meanwhile, the reading comprehension test was constructed based on four indicators: identifying main ideas, finding explicit information, interpreting implicit information, and summarizing text content. Prior to implementation, the test items were reviewed by subject experts to ensure content validity, and the internal consistency of the instrument was examined using Cronbach's Alpha to ensure reliability.

Data analysis employed both qualitative and quantitative techniques. Qualitative data obtained from expert comments and field notes were analysed descriptively as the basis for product revision. Quantitative data from pre-test and post-test scores were analysed using the Wilcoxon Signed Rank Test because the sample size was relatively small and the comparison involved two related measurements from the same participants. To measure the magnitude of students' score improvement, the normalized gain (N-Gain) formula proposed by Hake (1999) was also applied. The interpretation of N-Gain values is presented in Table 1. All statistical analyses were performed using SPSS software.

Tabel 1. Interpretation of N-Gain Values

Normalized Gain	Criteria Gain Score
$0.00 < N - Gain < 0.30$	Low
$0.30 \leq N - Gain \leq 0.70$	Medium
$N - Gain > 0.70$	High

RESULTS AND DISCUSSION

RESULT

This study aimed to develop and evaluate the feasibility as well as the preliminary effectiveness of a gamification-based teaching module in supporting students' reading comprehension skills. The

findings are presented based on expert validation and effectiveness testing.

The feasibility of the developed module was evaluated by media, language, and material experts. The validation results showed that the module achieved a feasibility score of 87.5% from the media expert, while both language and material experts provided scores of 83.3%. These results indicate that the developed module fulfilled the required criteria in terms of content appropriateness, language clarity, and media design, and was therefore considered highly feasible for classroom implementation.

To examine the module's potential contribution to students' reading comprehension, pre-test and post-test assessments were conducted. The average pre-test score was 56.4, indicating relatively limited initial reading comprehension performance among students. Following the implementation of the gamification-based module, the average post-test score increased to 89.2, reflecting substantial improvement in students' reading comprehension outcomes.

Prior to hypothesis testing, a normality test was conducted and indicated that the data were not normally distributed. Therefore, the Wilcoxon Signed Rank Test was employed to compare students' pre-test and post-test scores. The analysis revealed a statistically significant difference between the two measurements ($p < 0.001$), suggesting that students demonstrated better reading comprehension performance after using the developed module. In addition to statistical significance, an effect size analysis was conducted to examine the magnitude of the intervention effect using the Wilcoxon effect size formula, $\Gamma = \frac{z}{\sqrt{n}}$. The analysis showed a large effect size (r = 0,876), indicating that the implementation of the gamification-based module had a substantial practical influence on students' reading comprehension performance.

To further examine the magnitude of improvement, an N-Gain analysis was conducted, as presented in Table 2.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	25	.50	1.00	.7707	.15945
NGain_Persen	25	50.00	100.00	77.0667	15.94464
Valid N	25				

The average N-Gain score of 0.77 was categorized as high, indicating a substantial level of improvement in students' reading comprehension after the implementation of the module. Improvements were identified across several reading comprehension indicators, including identifying main ideas, locating explicit information, interpreting implicit meaning, and summarizing text content. These findings suggest that the integration of gamification elements into structured instructional activities may support students' cognitive engagement during reading tasks.

Nevertheless, the interpretation of these findings should be considered cautiously. Since this study employed a one-group pre-test-post-test design without a control group and involved a relatively small sample, the observed improvements cannot be attributed exclusively to the intervention. Therefore, the findings primarily provide preliminary evidence regarding the potential applicability of the gamification-based module in elementary reading instruction contexts.

DISCUSSION

The findings of this study indicate that the gamification-based teaching module has the potential to support improvements in students' reading comprehension skills. This tendency is reflected in the increase between pre-test and post-test scores, the high N-Gain category, and the statistically significant difference identified through the Wilcoxon Signed Rank Test. These findings suggest that integrating gamification elements into structured instructional materials may contribute positively to students' engagement and comprehension performance during reading activities.

One possible explanation for this improvement lies in the integration of gamification elements such as points, levels, and rewards within the learning process. These elements provide immediate feedback, structured progression, and reinforcement that may encourage students to participate more actively in instructional activities. Deterding et al., (2011) explain that gamification involves the application of game design elements in non-game contexts to increase user engagement and motivation. Rinaldi et al., (2021) argue that gamification can enhance participation by creating enjoyable and interactive learning experiences. In this study, the integration of

gamified activities appears to have supported students' willingness to engage more consistently with reading tasks.

The findings also demonstrate improvements across several reading comprehension indicators, including identifying main ideas, locating explicit information, interpreting implicit meanings, and summarizing text content. This suggests that the module may support not only surface-level understanding but also deeper cognitive processing during reading activities. The gradual structure of the module and its interactive tasks potentially enabled students to construct understanding step by step through active participation, which aligns with constructivist learning principles emphasizing learner-centered knowledge construction.

In addition, the use of visual and multimedia-supported instructional design may have contributed to students' comprehension development. According to Mayer, (2020), multimedia learning environments can facilitate cognitive processing by presenting information through organized visual and textual representations. In the present study, the combination of gamification elements and multimedia-supported layouts may have helped students maintain attention and process reading content more effectively.

The present findings are also consistent with previous studies reporting positive relationships between gamification and student engagement in learning. Claritas et al. (2024) found that gamification contributes to increased learning motivation, while Novianti (2024) and Sultan et al. (2024) reported improvements in participation and academic performance through gamified learning environments. Similarly, Syajida et al. (2024) emphasized that interactive digital learning media can increase students' learning interest and comprehension performance. The current study extends these findings by integrating gamification into a structured teaching module specifically designed around reading comprehension indicators in elementary language learning.

Nevertheless, the findings should be interpreted cautiously due to several methodological limitations. Since this study employed a one-group pre-test-post-test design without a control group, the observed improvement cannot be attributed solely to the intervention. Other factors, such as repeated exposure to test

formats, teacher guidance during implementation, classroom dynamics, or students' increasing familiarity with reading tasks, may also have influenced the results. Furthermore, the relatively small sample size limits the broader generalizability of the findings beyond the specific instructional context in which the study was conducted.

Another consideration is the possibility of a novelty effect, in which students may respond positively because the instructional media and activities were perceived as new and different from their usual classroom experiences. As a result, the increased engagement observed during implementation may not entirely reflect long-term instructional effectiveness. Therefore, future studies are recommended to employ experimental or quasi-experimental designs involving larger participant groups and control classes in order to examine the long-term impact and comparative effectiveness of gamification-based instructional modules more rigorously.

Overall, despite these limitations, the findings provide preliminary evidence that a gamification-based teaching module may serve as a promising instructional alternative for supporting elementary students' reading comprehension. Beyond improving learning outcomes, the module appears to encourage more active participation and meaningful interaction with reading materials, which are important aspects of effective literacy learning.

CONCLUSION

This study indicates that the gamification-based teaching module demonstrates promising feasibility and potential effectiveness in supporting elementary students' reading comprehension skills. The integration of gamification elements such as points, levels, and rewards appears to encourage students' engagement and supports improvements across several reading comprehension indicators, including identifying main ideas, locating explicit information, interpreting implicit meaning, and summarizing texts. Theoretically, these findings contribute to the growing discussion on gamification in education by highlighting its potential role when systematically integrated into structured instructional modules, particularly within elementary Indonesian language learning contexts. Practically, the developed module may serve as an

alternative instructional resource for teachers seeking to promote more interactive, student-centered, and meaningful reading instruction.

Nevertheless, the findings of this study should be interpreted within certain limitations. The relatively small sample size and the absence of a control group limit the generalizability of the results and prevent definitive conclusions regarding causal effectiveness. In addition, the study focused on a single instructional context, which may not fully represent broader elementary learning environments. Therefore, future research is recommended to involve larger and more diverse participant groups, apply experimental or quasi-experimental designs with control groups, and examine the long-term effectiveness of gamification-based instructional modules in supporting students' literacy development. To promote student-centered learning, foster cognitive development, and sustain students' motivation in language education.

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