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Interactive PowerPoint and Student Motivation in Enhancing Elementary Reading Comprehension

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ABSTRACT

This study aims to examine the effect of using interactive PowerPoint presentations and student motivation on students' reading comprehension in class IV at SD XYZ Tomang. This study offers novelty by integrating interactive multimedia learning through Interactive PowerPoint with a student motivation mediation model in Indonesian language instruction among elementary students. This study uses a quasi-experimental research design, with research subjects consisting of 53 students from class IVB and IVC at SD XYZ Tomang. It utilizes a questionnaire to assess student motivation and the use of interactive PowerPoint, along with a reading comprehension test. The findings indicate a significant improvement in reading comprehension, suggesting that structured and visually engaging presentations enhance comprehension and retention. However, its effect on motivation is insignificant, indicating that engagement alone does not necessarily boost motivation, which is influenced by student preferences. Moreover, motivation does not significantly impact reading comprehension and does not mediate the relationship between Interactive PowerPoint and reading comprehension. This suggests that Interactive PowerPoint directly supports cognitive learning rather than relying on motivation. The findings highlight the need for long-term studies and additional strategies enhance engagement and reading comprehension. Therefore the results imply that teachers can integrate Interactive PowerPoint as an effective instructional medium to improve elementary students' reading comprehension in classroom learning.

ABSTRAK

Penelitian ini bertujuan untuk menguji pengaruh penggunaan Interactive PowerPoint dan motivasi belajar siswa terhadap kemampuan reading comprehension siswa kelas IV di SD XYZ

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Tomang. Penelitian ini menawarkan kebaruan dengan mengintegrasikan pembelajaran multimedia interaktif melalui Interactive PowerPoint dan model mediasi motivasi belajar siswa dalam pembelajaran Bahasa Indonesia pada siswa sekolah dasar**.** Penelitian ini menggunakan desain quasi-experimental dengan subjek penelitian sebanyak 53 siswa dari kelas IVB dan IVC SD XYZ Tomang. Instrumen penelitian meliputi kuesioner motivasi belajar dan penggunaan Interactive PowerPoint, serta tes reading comprehension. Hasil penelitian menunjukkan adanya peningkatan signifikan pada kemampuan pemahaman membaca siswa, yang mengindikasikan bahwa presentasi yang terstruktur dan menarik secara visual dapat meningkatkan pemahaman serta retensi informasi. Namun, penggunaan Interactive PowerPoint tidak memberikan pengaruh signifikan terhadap motivasi belajar siswa, yang menunjukkan bahwa keterlibatan belajar saja belum tentu meningkatkan motivasi karena preferensi siswa. Selain itu, motivasi belajar juga tidak berpengaruh signifikan terhadap reading comprehension dan tidak memediasi hubungan antara penggunaan Interactive PowerPoint dengan reading comprehension. Temuan ini menunjukkan bahwa Interactive PowerPoint lebih berperan secara langsung dalam mendukung proses pembelajaran kognitif dibandingkan melalui peningkatan motivasi. Hasil penelitian juga menekankan pentingnya studi jangka panjang dan strategi pembelajaran tambahan untuk meningkatkan keterlibatan serta kemampuan reading comprehension siswa. Oleh karena itu, hasil penelitian ini mengimplikasikan bahwa guru dapat mengintegrasikan Interactive PowerPoint sebagai media pembelajaran yang efektif untuk meningkatkan kemampuan reading comprehension siswa sekolah dasar di kelas.

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1. PENDAHULUAN

Language is at the core of communication and plays a crucial role in education. In the digital era, globalization has brought significant changes, including the integration of technology into learning. The development of science, technology, and the arts has influenced the evolution and usage of the Indonesian language across various fields (Febriani et al., 2021). However, many students still face challenges in learning the language due to the lack of relevant and engaging learning materials (Nuraripin & Jaja, 2021).

Teaching Indonesian in primary schools faces challenges from both student diversity and teaching methods. Many students struggle with reading, which negatively affects their literacy development (Amelia et al., 2023). Traditional classrooms also tend to lack interactivity, which reduces students' engagement in learning (Sukma et al., 2023). A national-scale study by Susani (2018) revealed a learning loss in literacy equivalent to six months during the 2020–2021 period. This highlights the urgent need to improve literacy instruction (Winarni et al., 2023).

Reading comprehension is essential for academic success, as it enhances students' ability to understand and process information. In fourth grade, where reading becomes increasingly interdisciplinary, difficulties in comprehension significantly impact students' learning progress (Ardhian et al., 2020). At SD XYZ Tomang, an initial assessment showed that 82% of fourth-grade students struggled with understanding texts. It is displaying low reading speed and limited comprehension compared to upper-grade students (Sirait et al., 2025).

Teaching children requires a different approach than teaching adults. Young learners respond better to interactive and playful methods such as singing or movement-based activities (Vitasmoro & Chandra, 2019). Interactive media has proven effective in improving vocabulary and comprehension by exposing students to rich language input. (Çetinkaya et al., 2019). One such tool is interactive PowerPoint, which has been shown to capture students' attention in reading lessons (Anwar et al., 2020).

This study is grounded in the Cognitive Theory of Multimedia Learning (CTML), which explains how learners build understanding through multimedia elements (Mayer, 2020). Multimedia such as interactive PowerPoint fosters active learning through features like feedback, navigation buttons, and visual animation that boost student engagement (Angkarini, 2022). Each slide is meticulously designed with interactive buttons, encouraging users to interact with the content (Wijayanti & Relmasira, 2019). Furthermore, features such as narration, video, games, and quizzes embedded in interactive PowerPoint provide a more enjoyable and communicative learning experience (Putri & Nurafni, 2021).

Conventional teaching methods that overemphasize theory often make reading lessons monotonous and less meaningful. Without interactive support tools, students struggle to connect theory with practice in text comprehension (Ceyhan & Yıldız, 2020). Thus, experience-based and multimedia-driven learning approaches are needed to support literacy development (Asrial et al., 2019).

Motivation is a critical factor influencing student engagement and persistence in learning. A motivating classroom environment supports enjoyable learning experiences and enhances language skill development, particularly among students with low reading comprehension. It is reflected in the 2022 PISA findings, which showed that only around 25% of Indonesian students achieved Level 2 reading proficiency, the minimum benchmark for functional literacy (Malondeng & Wilade, 2025; OECD, 2023). Moreover,

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motivation acts as a mediator between the use of Interactive PowerPoint and improved reading comprehension (Çetinkaya et al., 2019). Therefore, it is essential to investigate how interactive PowerPoint affects students' learning motivation and reading comprehension simultaneously (Anwar et al 2020, 168).

While previous studies have explored the use of multimedia and motivation in language learning, few have specifically examined the combined impact of interactive PowerPoint and motivation on reading comprehension in upper elementary students, particularly in the context of Indonesian language learning. Most literature discusses multimedia or ICT integration in general (Anwar et al., 2020), without directly analyzing the relationship between these three variables in a structured classroom experiment.

Additionally, there is a lack of empirical studies using quasi-experimental designs to measure the effectiveness of interactive PowerPoint in improving reading comprehension through the student motivation in classroom settings. Very few have focused on fourth-grade students in Indonesia, where foundational reading skills are still being formed (i.e., Fajar & Mayar, 2023; Nasr, 2024). Previous studies mainly examined the direct relationship between student motivation and reading comprehension, while the mediating role of motivation in elementary education remains underexplored. Moreover, limited studies have investigated Interactive PowerPoint in Indonesian language learning among elementary students. Therefore, this study addresses these gaps by examining the direct and indirect effects of Interactive PowerPoint and student motivation on reading comprehension.

This issue is particularly relevant because reading comprehension remains a significant challenge among fourth-grade students. A preliminary test conducted at SD XYZ Tomang revealed that 82% of students experienced difficulties in understanding reading texts, indicating a serious gap in learning outcome. While previous studies have explored multimedia learning and student motivation separately, limited research has examined the Interactive PowerPoint alongside the mediating role of student motivation in improving reading comprehension among elementary students. Therefore, this study offers novelty by integrating both interactive multimedia learning and a motivation mediation model within Indonesian language instruction.

The purpose of this research is to investigate the influence of interactive PowerPoint presentations on motivation and reading comprehension among 4th-grade elementary students. Several research questions are proposed:

(i) Does the use of Interactive PowerPoint presentations affect 4th elementary school students' Indonesian reading comprehension compared to non-interactive PowerPoint presentations?
(ii) Does the use of Interactive PowerPoint presentations affect the motivation levels of 4th elementary school students compared to non-interactive PowerPoint presentations?
(iii) Does student motivation correlate to Indonesian reading comprehension among 4th elementary school students?
(iv) Does student motivation mediate the relationship between the use of Interactive PowerPoint and reading comprehension among 4th elementary school students?

2. METODE

This study adopts a quantitative research approach using a quasi-experimental non-equivalent control group pretest-posttest design to evaluate the effect of Interactive PowerPoint on reading comprehension and motivation among 4th-grade students. This design was selected due to the predetermined classroom structure at SD XYZ Tomang,

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where random assignment was not feasible. It aligns with the research context, as 82% of students struggle with reading comprehension, exacerbated by conventional teaching methods and limited use of interactive media.

Quasi-experiments allow for causal analysis without randomization (Anggraeni & Education, 2025; Igarashi et al., 2025), making it ideal for natural school settings (Ogbuanya, 2022). Each intact class is assigned as either experimental (Interactive PPT) or control (Traditional PPT). The design enables assessment of the intervention's impact while preserving the integrity of existing classroom arrangements.

Data are collected through tests and questionnaires. Following Sugiyono, (2021), quantitative methods identify relationships through statistical analysis. The study uses a survey method (Creswell & Creswell, 2017) to obtain data from the target population. This methodological combination allows the researcher to examine both reading comprehension performance and student motivation rigorously.

The study began with the development and tryout of instruments, which are reading comprehension tests, motivation questionnaires, and media usage questionnaires on February 7 and 14, 2025, with Class 4D (28 students) at SDK XYZ Tomang. After refinement, the main implementation involved two groups: experimental (Class 4C) and control (Class 4B), with each class receiving three meetings (2 JP each). On February 25, both groups were introduced to descriptive texts and completed the pretest and initial questionnaire. On March 3, the control group studied using traditional PowerPoint, while the experimental group used interactive PowerPoint. On March 13, both groups reviewed materials and completed the posttest, motivation questionnaire, and media usage questionnaire. The entire intervention was completed within two weeks, in accordance with the time limit set by the school. The collected data consisted of pretest, posttest, motivation, and media usage scores to evaluate the effectiveness of the intervention.

The Interactive PowerPoint used in this study included several features that distinguished it from traditional PowerPoint presentations. It utilized internal hyperlinks to connect students to related sections within the presentation (Izzatli, 2024), embedded audio and video to support vocabulary learning and listening comprehension (Yanartik & Mandarani, 2025), and interactive quizzes with animated feedback that displayed positive or negative responses based on students' answers. These features were designed to increase student engagement and enhance the learning experience (Subbulakshmi & Chandru, 2024). Therefore, this study compared the effectiveness of Interactive PowerPoint with traditional PowerPoint in supporting reading comprehension.

The study targeted 4th-grade students at XYZ Tomang Catholic Primary School, Jakarta, with a total population of 109 students across four classes. This research used a non-probability, convenience sampling method suited to quasi-experimental designs, selecting 53 students from Classes 4B (control group) and 4C (experimental group) based on accessibility and existing classroom arrangements. The assignment of classes was determined by the Indonesian language teacher, Mr. Heri, ensuring alignment with the school's schedule and minimizing disruption to regular learning.

This study employed three key research instruments to measure these three variables: use of interactive PowerPoint, student motivation, and reading comprehension. Grounded in the Cognitive Theory of Multimedia Learning (CTML), learners process information more effectively when verbal and visual elements are meaningfully integrated (Mayer, 2020). In this context, Interactive PowerPoint facilitates deeper learning through features such as videos, navigation buttons, and structured visual content that enhance students' engagement and comprehension (Nwangwu et al., 2021). The use of Interactive PowerPoint was measured using a 20-item questionnaire adapted

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from the Extended Technology Acceptance Model (E-TAM) by Ghani et al., (2019) covering four indicators: perceived usefulness, perceived ease of use, attitude, and behavioral intention, using a 4-point Likert scale.

This study also adopts Self-Determination Theory (SDT) to explain student motivation in learning. SDT emphasizes that students' motivation is influenced by autonomy, competence, and relatedness, which shape their engagement and persistence in learning activities (Ryan & Deci, 2022). In reading comprehension, SDT helps explain how internal motivation may support students' participation and learning outcomes within interactive digital learning environments (Guay, 2022; Smedt et al., 2020). Student motivation was measured using a 22-item questionnaire adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) by Liu et al., (2022) focusing on self-efficacy, intrinsic value, and test anxiety, also on a 4-point Likert scale with three reversed items.

Lastly, this study adopts Kintsch's Construction-Integration (C-I) Model to explain reading comprehension as a process of constructing meaning and integrating information with prior knowledge (Kintsch, 1988). Reading comprehension involves word decoding, inference making, and knowledge integration to achieve meaningful understanding of a text (Hannon, 2022; Sanir & Ozmen, 2022). comprehension was measured through a 20-item multiple-choice test grounded in Istiq'faroh et al., (2020) subscales consist of Literal Understanding, Reorganization, Inferential Understanding, Evaluation, and Appreciation with scores calculated using a standardized formula to reflect students' comprehension performance.

This study employed both prerequisite and hypothesis testing analyses using SPSS 27 and Microsoft Excel. Prerequisite tests included validity and reliability testing (Pearson's r and Cronbach's Alpha), normality testing using Shapiro-Wilk Test and homogeneity testing via Levene's Test to ensure data suitability. Once assumptions were confirmed, hypothesis testing was conducted using Independent Sample T-Test and Mann-Whitney U, as well as Spearman's Rho, based on normal and abnormal data distribution. Furthermore, the Sobel Test was used to examine the mediating role of motivation between the use of Interactive PowerPoint and reading comprehension. N-Gain analysis assessed instructional effectiveness by measuring improvement from pretest to posttest, categorized into high, medium, or low gain to interpret learning outcomes.

3. HASIL DAN PEMBAHASAN

This study began by establishing the validity and reliability of the three instruments used: interactive PowerPoint use, student motivation, and reading comprehension. The first two were measured through questionnaires, while reading comprehension was assessed using a standardized test. The validity and reliability analysis confirmed that both Traditional and Interactive PowerPoint instruments met acceptable standards across pretest and post-test phases. As shown in **Table 1**, the Traditional PowerPoint instrument demonstrated satisfactory construct validity during the pretest, with explained variances of 60.22% and 59.36% in both groups. Reliability was also acceptable, with Cronbach's alpha values of 0.87 and 0.62, indicating adequate internal consistency (Ghozali, 2018; Hair et al., 2019).

In the post-test phase, both instruments showed stronger performance. The Traditional PowerPoint instrument achieved a total explained variance of 92.65% with a reliability coefficient of 0.85, while the Interactive PowerPoint instrument recorded the highest explained variance of 99.24% and a Cronbach's alpha of 0.81. These findings indicate that both instruments, particularly the Interactive PowerPoint measure, were

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valid and reliable for assessing students' perceptions of instructional media use in this study.

Table 1. Traditional & Interactive PPT Validity & Reliability Distributions

PPT	Test	Total Variance (%)	Reliability
Traditional	Pretest	60.22	0.87
Traditional	Pretest	59.36	0.62
Traditional	Posttest	92.65	0.85
Interactive	Posttest	99.24	0.81

Table 2 below shows that the Student Motivation instrument demonstrated acceptable validity and reliability across both control and experimental groups in the pretest and posttest phases. The total explained variance ranged from 39.52% to 44.80%, indicating that the instrument was able to adequately capture the underlying dimensions of student motivation (Hair et al., 2019). Reliability coefficients were also consistent across all conditions, with Cronbach's alpha values ranging from 0.61 to 0.64, exceeding the minimum acceptable threshold of 0.60 for internal consistency (Ghozali, 2018). Overall, these results confirm that the Student Motivation questionnaire was sufficiently valid and reliable for measuring students' motivational levels throughout the study.

Table 2. Student Motivation Validity & Reliability Distributions.

Group	Test	Total Variances (%)	Reliability
CG	Pretest	44.80	0.64
EG	Pretest	44.41	0.61
CG	Posttest	44.60	0.61
EG	Posttest	39.52	0.62

Table 3 indicates that the Reading Comprehension Test (RCT) demonstrated acceptable validity and reliability across both control and experimental groups in the pretest and posttest phases. The number of valid items ranged from 11 to 12 out of 20, showing that most test items met the validity criteria, although several items were identified as invalid. Reliability coefficients ranged from 0.617 to 0.682, all exceeding the minimum acceptable threshold of 0.60, indicating satisfactory internal consistency (Ghozali, 2018). Overall, these results confirm that the Reading Comprehension Test (RCT) instrument was sufficiently reliable and appropriate for measuring students' reading comprehension throughout the study.

Table 3. RCT Validity & Reliability Distributions.

Group	Test	Items		Reliability
		Valid	Invalid	
CG	Pretest	12	8	0.682
EG	Pretest	11	9	0.661
CG	Posttest	11	8	0.617
EG	Posttest	11	8	0.661

After showing explanations of each instruments' validity and reliability, **Table 4** presents the results of the Shapiro-Wilk normality test for all study variables. The Student Motivation (SM) and PowerPoint Use (PPT) data in both control and experimental groups showed significance values above 0.05 across pretest and posttest phases, indicating that these datasets were normally distributed (Rana et al., 2021). Similarly, the Reading

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Comprehension Test (RCT) scores in the control group also met the normality assumption in both pretest and posttest. However, the experimental group's RCT scores showed non-normal distribution, with significance values of 0.028 in the pretest and 0.000 in the posttest, both below 0.05 (Mishra et al., 2019). These findings indicate that while most variables satisfied the normality assumption, the experimental group's reading comprehension data required non-parametric analysis in hypothesis testing.

Table 4. Shapiro-Wilk Normality Test.

Group	Statistic	Df	Sig.
SM Pretest Control	0.938	26	0.118
SM Posttest Control	0.965	26	0.489
SM Pretest Experimental	0.933	27	0.083
SM Posttest Experimental	0.953	27	0.253
PPT Pretest Control	0.967	26	0.549
PPT Posttest Control	0.946	26	0.185
PPT Pretest Experimental	0.956	27	0.292
PPT Posttest Experimental	0.975	27	0.746
RCT Pretest Control	0.969	26	0.609
RCT Posttest Control	0.954	26	0.283
RCT Pretest Experimental	0.914	27	0.028
RCT Posttest Experimental	0.625	27	0.000

Descriptions:
SM: Student Motivation
PPT: PowerPoint Used
RCT: Reading Comprehension Test

After assessing each data distributions normality in each instruments used in the study, **Table 5** presents the results of Levene's test for homogeneity of variance across all variables. The Student Motivation (SM) and PowerPoint Use (PPT) data in both control and experimental groups showed significance values above 0.05, indicating that the assumption of equal variances was met (Miharja & Bulayi, 2024). Similarly, the Reading Comprehension Test (RCT) in the control group also satisfied the homogeneity assumption ($p = 0.775$). However, the RCT data in the experimental group showed a significant result ($p = 0.004$), indicating unequal variances. This suggests that while most data were homogeneous, the experimental group's RCT scores violated the homogeneity assumption and required appropriate statistical consideration in further analysis.

Table 5. Levene Homogeneity Test.

Group	Levene Statistic	Df1	Df2	Sig.
SM Control*	0.320	1	50	0.574
SM Experimental*	0.606	1	52	0.440
PPT Control*	0.626	1	50	0.432
PPT Experimental*	0.834	1	52	0.365
RCT Control*	0.083	1	50	0.775
RCT Experimental**	9.208	1	52	0.004

(*) Based on Mean result on normal distribution
(**) Based on Median result on not normal distribution

As all prerequisite tests were completed in the previous section, this section proceeds with hypothesis testing for H1 to H4. Hypothesis 1 examines whether there is a significant difference in Indonesian reading comprehension between students using traditional PowerPoint and those using Interactive PowerPoint. Since the control group data were normally distributed while the experimental group data were not, the Mann-Whitney U

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test was applied. This non-parametric test is appropriate for comparing two independent groups when the assumption of normality is not fully met, despite homogeneous variances (Okoye & Hosseini, 2024). The results are summarized in **Table 6** below.

Table 6. Mann-Whitney U Test Results

	Posttest-Pretest
Z	-5,092
Asymp. Sig. (2-tailed)	<.001

Table 7. N-Gain Analysis Results

Group	**Control**		**Experiment**	
Test	**Pretest**	**Posttest**	**Pretest**	**Posttest**
Mean	63.78	67.95	71.1	93.83
N-Gain	0,4606 (46,06%)		0,8980 (89,80%)	
Description	**Less Effective**		**Effective**	

Table 6 presents the results of the Mann–Whitney U test, which yielded a Z-score of -5.092 and a significance value of < 0.001, indicating a statistically significant difference between groups. **Table 7** shows that the experimental group demonstrated greater improvement in reading comprehension than the control group. The control group's mean score increased from 63.78 to 67.95, with an N-Gain of 0.4606 (46.06%), categorized as less effective. In contrast, the experimental group improved from 71.1 to 93.83, achieving an N-Gain of 0.8980 (89.80%), categorized as effective. This interpretation of N-Gain effectiveness categories is followed by **Table 8.**

Table 8. N-Gain Effectiveness Categories

Average Percentage (%)	**Interpretation**
< 40	Ineffective
40-55	Less Effective
56-75	Effective Enough
>76	Effective

Source: Hake, (1999); Triyono et al., (2024)

These results indicate that Interactive PowerPoint was more effective than traditional PowerPoint in improving students' reading comprehension. Therefore, Hypothesis 1 is accepted, confirming a significant difference between both groups. This finding is consistent with previous studies showing that Interactive PowerPoint enhances engagement and comprehension more effectively than conventional instructional methods (Fajar & Mayar, 2023; Kusuma et al., 2022; Nasr, 2024). The results highlight the value of integrating interactive digital tools into modern learning environments.

Hypothesis 2 examined whether there was a significant difference in students' motivation between those using traditional PowerPoint and Interactive PowerPoint. Since both groups' posttest data were normally distributed, descriptive statistics and an Independent Samples t-test were applied. As shown in **Table 9**, the control group

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recorded a slightly higher mean score (M = 61.3) than the experimental group (M = 58.7), with relatively similar score distributions.

Table 9. Student Motivation Descriptive Statistics

Test	Mean	Std. Dev.	Variance	Range	Skewness	Kurtosis
Posttest Control	61.3	6.67	44.6	25	0.05	-0.81
Posttest Experimental	58.7	6.28	39.52	23	0.36	-0.60

Table 10. Independent Sample T-Test Results

	t	p-value	Mean	95% Confidence Interval	
				Lower	Upper
Equal Variances Assumed	1.440	0.156	2.57	-1.010	6.14

Table 10 further shows a t-value of 1.440 and a p-value of 0.156, which is above the 0.05 significance threshold, indicating no statistically significant difference between the two groups. Therefore, Hypothesis 2 is rejected, suggesting that Interactive PowerPoint did not significantly affect students' motivation compared to traditional PowerPoint. This finding aligns with studies showing that while technology-enhanced learning tools can support engagement, motivation is also shaped by learner preferences, self-efficacy, and classroom context (Sabbah et al., 2020). Although Abidin et al., (2023) found that Interactive PowerPoint could increase motivation, this study suggests that its impact on motivation may be limited unless combined with additional instructional strategies.

Table 11. Spearman Rank Correlation Results

Variables	ρ (Spearman's rho)	p-value	Interpretation
Student motivation & Reading Comprehension	-0.041	0.768	weak, non-significant negative correlation

Hypothesis 3 examined the relationship between student motivation and reading comprehension using Spearman's rank correlation, as the reading scores in both groups were not normally distributed. Based on **Table 11,** the analysis showed a weak negative correlation between student motivation and reading comprehension (ρ = -0.041, p = 0.768), indicating no statistically significant relationship between the two variables. Therefore, Hypothesis 3 is rejected, suggesting that student motivation did not significantly influence reading comprehension in this study. Although previous research has found that higher motivation can improve comprehension through the association of reading self-efficacy (Bakkaloğlu & Pilten, 2023; Orellana et al., 2020). The non-significant result in this study may be influenced by the relatively small sample size and short intervention period. These findings suggest that the effect of motivation on reading comprehension may require longer observation to become more evident.

Table 12. Linear Regression & Mediation Results

Path	Unstandardized B	Std. Error	t	Sig.
PPT Use => SM (a)	0.076	0.092	0.826	0.412
PPT Use => RCT via SM (b)	0.555	0.276	2.013	0.049
Mediation	**Sobel**	**Std. Error**		**Sig.**
PPT Used => SM => RCT	0.764	0.055		0.444

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Hypothesis 4 examined whether student motivation mediated the relationship between Interactive PowerPoint use and reading comprehension through linear regression and Sobel test analysis. As shown in **Table 12,** the regression coefficients from PowerPoint use to student motivation (path a = 0.076, SE = 0.092) and from student motivation to reading comprehension (path b = 0.555, SE = 0.276) were used to calculate the indirect effect. The Sobel test result (Sobel = 0.764, p = 0.444) indicated that the mediation effect was not statistically significant. Therefore, Hypothesis 4 is rejected, suggesting that student motivation did not mediate the relationship between Interactive PowerPoint and reading comprehension. While previous studies found that Interactive PowerPoint can increase motivation by enhancing engagement and participation (Dwiqi et al., 2020; Putri & Nurafni, 2021; Zahara & Jupri, 2022), this study suggests that Interactive PowerPoint may improve reading comprehension more directly through its instructional features rather than through changes in student motivation.

Based on the hypothesis testing results, the significant improvement in reading comprehension among students using Interactive PowerPoint can be explained through the Cognitive Theory of Multimedia Learning (CTML), which states that learners process information more effectively when verbal and visual elements are meaningfully integrated (Mayer, 2020). Interactive features such as videos, hyperlinks, navigation buttons, and animated quizzes likely supported students' cognitive processing by reducing cognitive overload and helping them organize information more efficiently (Hristov et al., 2026). Previous studies also found that multimedia-supported instruction enhances comprehension and retention because students become more actively engaged in processing learning materials (Theresia, 2025). Therefore, Interactive PowerPoint may improve reading comprehension by facilitating deeper cognitive processing rather than relying solely on passive text exposure.

These findings also align with the Construction-Integration (C-I) Model, which explains that reading comprehension occurs when learners connect textual information with prior knowledge and integrate it into meaningful understanding (Kintsch, 1988). Interactive PowerPoint may support this process through structured visual presentation, segmented content, and immediate feedback that help students organize and retain information more effectively (Heriani, 2025). Research has shown that multimedia learning environments can improve inference making, vocabulary retention, and knowledge integration among elementary students (Abebe et al., 2025). This may explain why the experimental group demonstrated substantially higher gains in reading comprehension despite the relatively short intervention period.

In contrast, student motivation did not significantly differ between groups and did not mediate reading comprehension outcomes. This suggests that the effectiveness of Interactive PowerPoint was more cognitive than motivational in nature. Based on Self-Determination Theory (SDT), motivation is influenced not only by instructional media but also by autonomy, competence, classroom environment, and individual learner preferences (Ryan & Deci, 2022). Although interactive media may increase classroom engagement and participation, motivational development often requires longer instructional exposure and more consistent learning experiences (Rocha-Feregrino & Sánchez, 2025). Therefore, while Interactive PowerPoint effectively improved comprehension, student preferences may still be necessary to strengthen students' intrinsic motivation and sustain long-term learning engagement.

Lastly, this study has two main limitations. First, the intervention period was relatively short, lasting only four days, which may not fully capture the long-term impact of Interactive PowerPoint on reading comprehension and student motivation. Second, the

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study focused only on 4th-grade students, limiting the generalizability of the findings to other grade levels and developmental stages. Therefore, future research is recommended to involve longer intervention periods and more diverse student samples to better examine the effectiveness of Interactive PowerPoint across different educational contexts.

4. SIMPULAN

In light of the above findings, interactive PowerPoint is effective in improving students' reading comprehension, while student motivation does not significantly influence or mediate reading outcomes. These findings indicate that the effectiveness of Interactive PowerPoint is primarily driven by its interactive instructional features rather than motivational factors. This study reinforces the effectiveness of interactive PowerPoint in improving elementary students' reading comprehension. Considering the importance of integrating effective digital learning tools in primary education, it is recommended that:

(i) Schools provide adequate training and technological resources to support teachers in optimizing the use of Interactive PowerPoint in classroom instruction.
(ii) Teachers adopt more engaging instructional strategies, such as gamification and personalized learning approaches, to maximize student participation and reading comprehension outcomes.
(iii) Future researchers expand this study by including other language skills, larger sample sizes, longer intervention periods, and additional variables such as emotional factors, engagement, and cross-grade comparisons to obtain broader insights

5. PERNYATAAN PENULIS

Penulis menyatakan bahwa tidak terdapat konflik kepentingan terkait penerbitan artikel ini. Penulis menegaskan bahwa naskah artikel bebas dari plagiarisme.

6. REFERENSI

Abebe, F., Trainin, G., & Asharafabadi, F. (2025). Preservice TPACK: The Critical Role of Context in Shaping Elementary Teacher Preparedness in Mathematics. *Learntechlib.OrgF Abebe, G Trainin, F AshrafabadiSociety for Information Technology & Teacher Education International, 2025•learntechlib.Org*. https://www.learntechlib.org/p/225913/

Abidin, Z., Herman, T., & Elina Penehafo, A. (2023). COMPUTATIONAL THINKING WITH AN OPEN-ENDED APPROACH USING INTERACTIVE POWERPOINT MEDIA: AN EXPERIMENT IN ELEMENTARY SCHOOLS. In *Z. Abidin et al. Journal of Engineering Science* (Vol. 18, Number 3).

Amelia, R., Dwitalia Sari, D., & Hidayati, R. (2023). *Licensed under a Creative Commons Attribution 4.0 International License Journal of Elementary School Education The Existence of Indonesian Language in Learning: Knowledge Manager in Elementary School* (Vol. 1).

Anggraeni, D., & Education, E. S. (2025). A Systematic Literature Review on The Effectiveness of The Teams Games Tournament (TGT) Model with Flashcard Media in Enhancing Early Reading Skills in. *Proceedings.Upi.EduD Anggraeni, E Supriatna, W SopandiInternational Conference on Elementary Education, 2025•proceedings.Upi.Edu*. https://proceedings.upi.edu/icee/article/view/697

DOI: https://doi.org/10.17509/e.v25i2.99743
p- ISSN 2528-1410 e- ISSN 2527-8045

Angkarini, T. (2022). Utilizing Interactive Powerpoint To Develop Students' Speaking Skils In New Normal. *Journal of Learning and International Studies*, *2*(2). https://doi.org/10.46637/jlis.v2i2.26

Anwar, Z., Kahar, M. S., Rawi, R. D. P., Nurjannah, N., Suaib, H., & Rosalina, F. (2020). Development of Interactive Video Based Powerpoint Media In Mathematics Learning. *Journal of Educational Science and Technology (EST)*, 167–177. https://doi.org/10.26858/est.v6i2.13179

Ardhian, T., Ummah, I., Anafiah, S., & Rachmadtullah, R. (2020). Reading and critical thinking techniques on understanding reading skills for early grade students in elementary school. *International Journal of Instruction*, *13*(2), 107–118. https://doi.org/10.29333/iji.2020.1328a

Asrial, A., Syahrial, S., Kurniawan, D. A., Subandiyo, M., & Amalina, N. (2019). Exploring obstacles in language learning among prospective primary school teacher. *International Journal of Evaluation and Research in Education*, *8*(2), 249–254. https://doi.org/10.11591/ijere.v8i2.16700

Bakkaloğlu, S., & Pilten, G. (2023). Examining the Relationship Between Reading Motivation and Reading Comprehension Self-Efficacy Perception. *International Journal of Psychology and Educational Studies*, *10*(1), 144–158. https://doi.org/10.52380/ijpes.2023.10.1.909

Çetinkaya, F. Ç., Ateş, S., & Yıldırım, K. (2019). Effects of Interactive Book Reading Activities on Improvement of Elementary School Students'; Reading Skills. *International Journal of Progressive Education*, *15*(3), 180–193. https://doi.org/10.29329/ijpe.2019.193.13

Ceyhan, S., & Yıldız, M. (2020). The effect of interactive reading aloud on student reading compre-hension, reading motivation and reading fluency*. *International Electronic Journal of Elementary Education*, *13*(4), 421–431. https://doi.org/10.26822/iejee.2021.201

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Dwiqi, C. S. G., Sudatha, I. G. W., & Studi, P. (2020). Pengembangan Multimedia Pembelajaran Interaktif Mata Pelajaran IPA Untuk Siswa SD Kelas V Adrianus I Wayan Ilia Yuda Sukmana. In *Jurnal EDUTECH Universitas Pendidikan Ganesha* (Vol. 8, Number 2). https://ejournal.undiksha.ac.id/index.php/JEU

Fajar, B., & Mayar, F. (2023). Interactive Powerpoint Media in Grade IV Elementary School. *Journal of Education Research and Evaluation*, *7*(3), 391–398. https://doi.org/10.23887/jere.v7i3.66424

Febriani, M., Prasandha, D., Utami, S. P. T., Setyaningsih, N. H., Yuniawan, T., & Sugiarto, E. (2021). The online comic development of Indonesian Folklore as a literature learning media for millennials. *IOP Conference Series: Materials Science and Engineering*, *1098*(3), 032015. https://doi.org/10.1088/1757-899x/1098/3/032015

Ghani, A., Hamzah, M., Ramli, S., Ab, W., Daud, A. W., Rijal, T., Romli, M., Najihah, N., & Mokhtar, M. (2019). A QUESTIONNAIRE-BASED APPROACH ON TECHNOLOGY ACCEPTANCE MODEL FOR MOBILE DIGITAL GAME-BASED LEARNING. *Journal of Global Business and Social Entrepreneurship (GBSE)*, *5*(14), 24621714. www.gbse.com.my

Ghozali, I. (2018). *Aplikasi analisis multivariete dengan program IBM SPSS 23*.

Guay, F. (2022). Applying Self-Determination Theory to Education: Regulations Types, Psychological Needs, and Autonomy Supporting Behaviors. *Canadian Journal of School Psychology*, *37*(1), 75–92. https://doi.org/10.1177/08295735211055355

Hair, J. F., Sarstedt, M., & Ringle, C. M. (2019). Rethinking some of the rethinking of partial least squares. *Emerald.Com*, *53*(4), 566–584. https://doi.org/10.1108/EJM-10-2018-0665

Hake, R. R. (1999). Analyzing Change/Gain Scores" dalam www. physycs. indiana. edu/~ sdi. *AnalysingChange-Gain. Pdf*.

Hannon, B. (2022). Children's Comprehension of Narrative and Expository Texts: The Contributions of Word Decoding and Knowledge Integration Skills Vary Within and Between Text Types. *Journal of Education and Training Studies*, *10*(4), 1. https://doi.org/10.11114/jets.v10i4.5465

Heriani, V. (2025). Improving Student Learning Outcomes in Mathematics Learning Using Interactive Powerpoint at MI Negeri 2 Ambon. *Ejournal.Mgedukasia.or.IdV HerianiJournal of Media and Learning Technology, 2025•ejournal.Mgedukasia.or.Id*, *1*(1). https://ejournal.mgedukasia.or.id/index.php/jmlt/article/view/35

Hristov, G., Mihnev, P., on, T. Z.-M.-I. C., & 2024, undefined. (2026). Applying Cognitive Load Theory to Teaching Programming in Elementary Education. *SpringerG Hristov, P Mihnev, T Zafirova-MalchevaIberian Conference on Information Systems and Technologies, 2024•Springer*, 135–145. https://doi.org/10.1007/978-3-032-12885-0_13

Igarashi, A., Takaoka, M., Fujita, Y., Koizumi, C., Miyazawa, N., Matsumoto, H., & Yamamoto-Mitani, N. (2025). Effects of Age-Friendly Education on Helping Intention and Attitude for Older Adults of Elementary Students: A Quasi-Experimental Study in Japan. *Journals.Sagepub.ComA Igarashi, M Takaoka, Y Fujita, C Koizumi, N Miyazawa, H Matsumoto, N Yamamoto-MitaniJournal of Applied Gerontology, 2025•journals.Sagepub.Com*. https://doi.org/10.1177/07334648251358542

Istiq'faroh, N., Suhardi, S., Mustadi, A., & Ahdhianto, E. (2020). The effect of indonesian folktales on fourth-grade students' reading comprehension and motivation. *Elementary Education Online*, *19*(4), 2149–2160. https://doi.org/10.17051/ilkonline.2020.763772

Izzatli, S. (2024). Hyperlink usage in local news websites in Azerbaijan. *Jpis.AzS IzzatliProblems of Information Society, 2024•jpis.Az*. https://jpis.az/en/journals/328

Kintsch, W. (1988). The Role of Knowledge in Discourse Comprehension: A Construction-Integration Model. In *Psychotocical Review* (Vol. 95, Number 2).

Kusuma, D., Utomo, &, & Slamet. (2022). The Effectiveness of Blended Learning Assisted by Interactive PowerPoint on Student Achievement of Elementary School Students in Bintarum Group, Demak District. *ANP JOURNAL OF SOCIAL SCIENCE AND HUMANITIES*, *3*, 47–53. https://doi.org/10.53797/anp.jssh.v3sp2.6.2022

Liu, M., Gorgievski, M. J., Qi, J., & Paas, F. (2022). Increasing teaching effectiveness in entrepreneurship education: Course characteristics and student needs differences. *Learning and Individual Differences*, *96*, 102–147. https://doi.org/https://doi.org/10.1016/j.lindif.2022.102147

Malondeng, F., & Wilade, S. (2025). The Role of Reading Interest in Indonesian Language Academic Performance: A Study of Elementary School Students. *Ejournal.Papanda.OrgFRD Malondeng, S Wilade, M Aqil, Z ZulnurainiJournal of Innovation and Research in Primary Education, 2025•ejournal.Papanda.Org*. https://ejournal.papanda.org/index.php/jirpe/article/view/2004

DOI: https://doi.org/10.17509/e.v25i2.99743
p- ISSN 2528-1410 e- ISSN 2527-8045

Mayer, R. E. (2020). *Multimedia Learning* (3rd ed.). Cambridge University Press. https://doi.org/DOI: 10.1017/9781316941355

Miharja, M. A., & Bulayi, M. (2024). Realistic mathematics education: Unlocking problem-solving potential in students. *Interval: Indonesian Journal of Mathematical Education*, *2*(1), 50–59.

Mishra, P., Singh, U., Pandey, C., Mishra, P., & Pandey, G. (2019). Application of student's t-test, analysis of variance, and covariance. *Annals of Cardiac Anaesthesia*, *22*(4), 407. https://doi.org/10.4103/aca.aca_94_19

Nasr, D. S. (2024). The Effect of Interactive PowerPoint Presentations on Primary Stage Students' Reading Comprehension. *Education (Al-Azhar): A Peer-Reviewed Scientific Journal for Educational, Psychological and Social Research*, *43*(203), 605–656. https://doi.org/10.21608/jsrep.2024.389471

Nuraripin, M., & Jaja, S. K. (2021). Thematic Teaching Materials Based on Interactive Multimedia in Elementary School. *International Journal of Secondary Education*, *9*(2), 62. https://doi.org/10.11648/j.ijsedu.20210902.15

Nwangwu, E. C., Obichukwu, P. U., Uzuagu, A. U., & Omeh, C. B. (2021). Development of an Interactive PowerPoint Presentation Design Training Package (IPPDTP) for Lecturers of Tertiary Institutions. *International Journal of Technologies in Learning*, *28*(2), 39–62. https://doi.org/10.18848/2327-0144/CGP/V28I02/39-62

OECD. (2023). *PISA 2022 Results (Volume I)*. *PISA*. https://doi.org/10.1787/53F23881-EN

Ogbuanya, T. C. (2022). EFFICACY OF PROBLEM-BASED LEARNING ON ACADEMIC PERFORMANCE OF ELECTRONIC WORK STUDENTS WITH LOW ABILITY. *SOUTH AFRICA INTERNATIONAL CONFERENCE ON EDUCATION*, 136.

Okoye, K., & Hosseini, S. (2024). Mann–Whitney U Test and Kruskal–Wallis H Test Statistics in R. In *R programming: Statistical data analysis in research* (pp. 225–246). Springer.

Orellana, P., Melo, C., Baldwin, P., De Julio, S., & Pezoa, J. (2020). The relationship between motivation to read and reading comprehension in chilean elementary students. *Reading and Writing*, *33*, 2437–2458.

Putri, H. P., & Nurafni, N. (2021). Pengaruh Media Pembelajaran PowerPoint Interaktif terhadap Hasil Belajar IPS Siswa Sekolah Dasar. *EDUKATIF : JURNAL ILMU PENDIDIKAN*, *3*(6), 3538–3543. https://doi.org/10.31004/edukatif.v3i6.986

Rana, S., Eshita, N. N., & Al Mamun, A. S. M. (2021). Robust normality test in the presence of outliers. *Journal of Physics: Conference Series*, *1863*(1), 012009.

Rocha-Feregrino, G., & Sánchez, G. (2025). Transforming the teaching of probability and statistics: The impact of AI-driven contextualization on architecture students' motivation. *Ieeexplore.Ieee.OrgG Rocha-Feregrino, GS Sánchez2025 Institute for the Future of Education Conference (IFE), 2025•ieeexplore.Ieee.Org*. https://ieeexplore.ieee.org/abstract/document/11024621/

Ryan, R. M., & Deci, E. L. (2022). Self-Determination Theory. In *Encyclopedia of Quality of Life and Well-Being Research* (pp. 1–7). Springer International Publishing. https://doi.org/10.1007/978-3-319-69909-7_2630-2

Sabbah, K., Kobari, S., Ahmad, M. A., & Daher, W. (2020). The Effect of education for future program on teachers' competencies in a public school. *Universal Journal of Educational Research*, *8*(7), 2890–2897. https://doi.org/10.13189/ujer.2020.080716

Sanir, H., & Ozmen, E. R. (2022). MULTI-COMPONENT MODELS OF READING COMPREHENSION: IMPORTANT FACTORS IN READING CO. *International Journal*

of Education Technology and Scientific Researches. https://doi.org/10.35826/ijetsar.525

Sirait, E. E., Ramadani, F. A., Amalia, P., Siagian, A. S. B., & Simagunsong, E. S. T. (2025). Analisis Kemampuan Membaca Cepat pada Anak Usia 10-15 Tahun di SD 1 Mardliatul Islamiyah. *Indonesian Journal of Education and Development Research*, *3*(1).

Smedt, F. De, Rogiers, A., Heirweg, S., Merchie, E., & Van Keer, H. (2020). Assessing and Mapping Reading and Writing Motivation in Third to Eight Graders: A Self-Determination Theory Perspective. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.01678

Subbulakshmi, N., & Chandru, R. (2024). SmartSignQuiz A Colour-Based Interactive Quiz System for Hard to Talk and Hard to Hear Students. *Ieeexplore.Ieee.OrgN Subbulakshmi, R Chandru, SA Begum, MV Pavalla, MM Palagiri2024 International Conference on Sustainable Communication, 2024•ieeexplore.Ieee.Org*. https://ieeexplore.ieee.org/abstract/document/10864242/

Sugiyono. (2021). *Metode penelitian kuantitatif kualitatif dan R & D* (Sutopo, Ed.; 2nd ed.).

Sukma, E., Ramadhan, S., Aldiyah, M. P., & Sihes, A. J. (2023). Challenges in Implementing Indonesian Language Teaching Materials in Elementary Schools. *International Electronic Journal of Elementary Education*, *16*(2), 225–237. https://doi.org/10.26822/iejee.2024.327

Theresia, N. (2025). Development of an Engaging and Effective Digital Learning Model for Fifth-Grade Students at Private Elementary School RK 2. *Conference.Um.Ac.IdND TheresiaProceedings Series of Educational Studies, 2025•conference.Um.Ac.Id*. https://conference.um.ac.id/index.php/pses/article/view/10578

Triyono, A., Nuary, R. H., Permatasari, N., Yuni, Y., & Wibowo, T. (2024). The level of effectiveness of tps and conventional methods judging from students' geometry learning results using the N-Gain Test. *AlphaMath: Journal of Mathematics Education*, *10*(1), 142–156.

Vitasmoro, P., & Chandra, A. I. (2019). *Improving Student's English Vocabulary Mastery through Animation Cartoon*.

Wijayanti, W., & Relmasira, C. (2019). Pengembangan Media PowerPoint IPA Untuk Siswa Kelas IV SD Negeri Samirono. In *Jurnal Penelitian dan Pengembangan Pendidikan* (Vol. 3, Number 2).

Winarni, R., Slamet, S. Y., & Syawaludin, A. (2023). *Elementary School Teachers' Perspectives on Accelerated Learning Models for Indonesian Language Skills* (pp. 556–563). https://doi.org/10.2991/978-2-38476-114-2_52

Yanartik, N., & Mandarani, l. (2025). Enhancing EFL Speaking with Simple Tech: A Junior High Experiment Using Audio-Visual Slides. *Jurnal.Fkip-Uwgm.Ac.IdNR Yanartik, V MandaraniBorneo Educational Journal (Borju), 2025•jurnal.Fkip-Uwgm.Ac.Id*. https://doi.org/10.24903/bej.v7i2.2058

Zahara, M. A., & Jupri, A. R. (2022). The Effect of Microsoft PowerPoint Interactive Learning Media Application on Reading Comprehension Skills of 3rd Grade Elementary School Students for Indonesian Language Subjects. *Jurnal Paedagogy*, *9*(3), 532. https://doi.org/10.33394/jp.v9i3.5383

DOI: https://doi.org/10.17509/e.v25i2.99743
p- ISSN 2528-1410 e- ISSN 2527-8045