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Efforts to Increase Student Learning Motivation Through the Implementation of Interactive Media at SDN 48 Palembang

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Abstract

This study addresses the growing concern regarding declining learning motivation among elementary school students in the digital era and explores the potential of interactive digital media as an effective pedagogical intervention. The primary objective was to empirically evaluate the impact of interactive digital media on the learning motivation of fifth-grade students at SDN 48 Palembang. Employing a quantitative quasi-experimental approach with a pretest-posttest control group design, the research involved 30 students purposively selected and divided into experimental (n=15) and control (n=15) groups. The experimental group received instruction utilizing interactive smartboard-based media over two 60-minute sessions, while the control group engaged in conventional teacher-centered instruction. Data were collected through a validated learning motivation questionnaire and analyzed using parametric statistical tests, including normality, homogeneity, and independent samples t-tests. The results revealed a substantial and statistically significant improvement in learning motivation for the experimental group (mean gain: 20.20 points) compared to the control group (mean gain: 7.30 points), with t = 3.215 and p = 0.003. These findings demonstrate that interactive digital media effectively enhances students' affective engagement by transforming passive learning routines into dynamic, student-centered

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experiences. Consequently, the study underscores the strategic importance of integrating purposefully designed digital tools into elementary curricula to foster sustained academic motivation. Educators and school administrators are encouraged to adopt technology-enhanced pedagogical strategies supported by continuous teacher training and adequate digital infrastructure.

Keywords: Learning motivation, interactive media, elementary education

INTRODUCTION

The rapid advancement of digital technology has fundamentally transformed educational paradigms, particularly in elementary education, where foundational cognitive and affective skills are developed. In the context of Industry 4.0 and the post-pandemic era, the integration of digital tools into pedagogical practices has shifted from an optional enhancement to a structural necessity (Fazalani et al., 2022; Ghazali et al., 2022; Rukmana et al., 2023; Susanti et al., 2022; Tuhuteru et al., 2023). This technological acceleration has redefined how knowledge is accessed, delivered, and internalized, compelling educational institutions to adapt their instructional strategies to align with contemporary learners' digital-native characteristics (Agustina et al., 2025; Alfiyanto et al., 2024; Arikarani & Amirudin, 2021; Pudyastuti et al., 2024). However, despite the widespread availability of digital infrastructure, the translation of technological potential into meaningful educational outcomes remains inconsistent, particularly in developing interactive and motivation-driven learning environments.

A critical challenge emerging from this digital transition is the documented decline in learning motivation among elementary school students, a phenomenon that has become increasingly complex and multidimensional. Motivation serves as a fundamental driver of academic engagement and achievement, yet contemporary educational settings frequently report diminished student enthusiasm, reduced classroom participation, and increased learning apathy (Meilinda et al., 2024; Ningrum et al., 2025). Several intersecting factors contribute to this decline, including the unregulated use of smartphones, excessive engagement with online gaming, and lingering post-pandemic learning fatigue that has normalized passive screen consumption over active academic inquiry (Rika et al., 2023; Romadany & Dananier, 2024; Sukma et al., 2022). Given that elementary learners are predominantly in the concrete operational stage, they require highly stimulating, visually engaging, and interactive pedagogical experiences to sustain intrinsic motivation and cognitive focus (Handayani et al., 2021).

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Compounding this motivational deficit is the continued reliance on conventional, teacher-centered instructional models that are increasingly misaligned with the needs of modern learners. Traditional pedagogical approaches, characterized by lecture-dominated delivery, static textbooks, and rigid classroom structures, frequently induce learning monotony, suppress active participation, and limit opportunities for exploratory learning (Fernandes et al., 2022; Ghofur & Rachma, 2021; Rawung, 2021). Furthermore, many elementary educators face significant challenges in digital competency, often lacking the technical proficiency and pedagogical training required to design or implement dynamic, technology-enhanced learning materials (Sinensis et al., 2023; Tesalonika et al., 2022). This disconnect between students' digitally saturated lifestyles and the static nature of conventional classroom instruction exacerbates motivational disengagement and hinders the development of self-regulated learning habits.

In response to these limitations, contemporary educational research strongly advocates for a paradigm shift toward technology-based and interactive media approaches that prioritize student-centered learning and active knowledge construction. Interactive digital media—encompassing animated visualizations, gamified platforms, digital flipbooks, and smartboard-integrated lessons—leverage multimodal stimuli to capture attention, facilitate conceptual understanding, and foster sustained academic engagement (Abdillah et al., 2024; Ali et al., 2025; Milanti et al., 2023). Unlike passive instructional tools, interactive media require direct learner manipulation, immediate feedback, and contextualized problem-solving, which collectively align with developmental psychology principles and significantly enhance both intrinsic and extrinsic motivation (Kuncahyono & Zutiasari, 2022; Rosiana et al., 2025). Empirical evidence increasingly confirms that well-designed interactive interventions can transform monotonous learning routines into dynamic, inquiry-driven experiences that resonate with young learners.

Despite the growing body of literature on digital pedagogy, a notable research gap persists regarding the specific affective impacts of interactive media on elementary students' learning motivation. The majority of existing studies predominantly focus on cognitive outcomes, such as test scores, conceptual retention, and academic performance, while systematically underexamining motivational constructs, emotional engagement, and long-term learning dispositions (Surbakti & Chantrin, 2025; Wahyunisari et al., 2023). Moreover, much of the current research remains descriptive, qualitative, or limited to non-experimental designs, lacking rigorous quasi-experimental validation in authentic classroom settings (Zheng et al., 2024). Consequently, there is a pressing need for controlled empirical investigations that isolate the causal effect of interactive digital media on motivation, particularly within Indonesian elementary contexts where

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digital integration remains uneven and pedagogical practices vary widely.

To address this gap, the present study employs a quantitative quasi-experimental design to empirically evaluate the impact of interactive digital media on the learning motivation of fifth-grade students at SDN 48 Palembang. Utilizing a pretest-posttest control group design, the research systematically compares motivational outcomes between an experimental group exposed to structured interactive media interventions and a control group receiving conventional instruction. The primary objective is to determine whether the integration of interactive digital tools yields a statistically significant enhancement in students' learning motivation, as measured through validated psychometric instruments. By isolating the treatment effect through controlled experimental conditions, this study seeks to provide robust, data-driven evidence on the motivational efficacy of technology-mediated pedagogy in elementary education.

The findings of this research carry substantial theoretical and practical implications for contemporary educational practice. Theoretically, the study contributes to the expanding discourse on affective learning outcomes by demonstrating how interactive media can systematically foster motivation beyond mere cognitive gains. Practically, it offers educators, school administrators, and curriculum developers empirically grounded strategies for integrating digital tools into daily instruction, supporting the broader institutional transition toward student-centered, technology-enhanced learning environments. Furthermore, the results are expected to inform policy decisions regarding teacher training, infrastructure allocation, and pedagogical innovation in primary education, ultimately guiding stakeholders toward sustainable digital transformation. It is hypothesized that students exposed to interactive digital media will demonstrate significantly higher learning motivation compared to those undergoing conventional instruction, thereby affirming the transformative potential of purposefully designed educational technology.

METHODS

This study employs a quantitative quasi-experimental approach utilizing a pretest-posttest control group design to empirically evaluate the effect of interactive digital media on the learning motivation of fifth-grade students at SDN 48 Palembang. The research sample comprised 30 students selected through purposive sampling, ensuring initial academic equivalence across classes, and subsequently allocated into an experimental group (n=15) and a control group (n=15). The primary measurement instrument was a validated learning motivation questionnaire based on a Likert scale, which underwent construct validity and internal reliability testing to ensure

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accurate assessment of the affective variable. This design was strategically selected to isolate the causal impact of the interactive media intervention while controlling for extraneous variables commonly present in natural classroom settings.

The research procedure was systematically executed across three phases: preparation, intervention, and post-intervention evaluation. Initially, both groups completed a pretest to establish baseline motivation levels. During the intervention phase, the experimental group engaged in two 60-minute IPAS (Integrated Science and Social Studies) sessions facilitated by interactive digital media via smartboard technology, incorporating dynamic visuals, simulations, and responsive quizzes. Conversely, the control group received conventional instruction utilizing lectures, structured discussions, and printed materials. Following the treatment, a posttest was administered to measure motivational shifts. Collected data were analyzed using statistical software, commencing with prerequisite tests for normality (Shapiro-Wilk) and homogeneity of variances (Levene's Test). Upon satisfying parametric assumptions, an independent samples t-test was conducted at a significance level of $\alpha = 0.05$ to objectively determine whether statistically significant differences in learning motivation existed between the experimental and control groups.

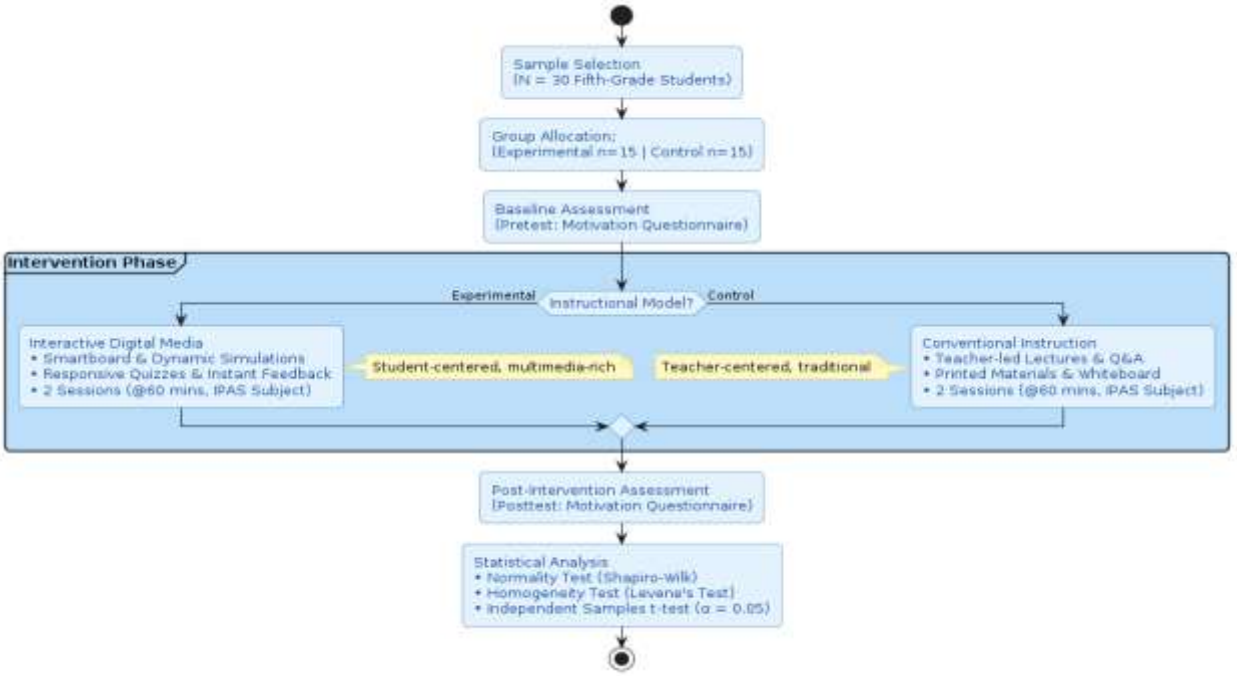


Figure 1. Research Methodology Flowchart

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The flowchart above systematically visualizes the methodological framework, clearly delineating the sequential phases from initial sampling and baseline measurement through controlled intervention to final statistical evaluation. By mapping the parallel trajectories of the experimental and control groups, the diagram highlights how the pretest-posttest control group design isolates the specific effect of interactive digital media on student motivation while holding extraneous instructional variables constant. Each node corresponds to a rigorously defined procedural step, ensuring internal validity through standardized timing, consistent subject matter, and comparable assessment instruments. Ultimately, this visual architecture not only clarifies the operational workflow for readers but also reinforces the empirical robustness of the quasi-experimental approach, demonstrating how structured pedagogical manipulation and parametric statistical validation converge to yield actionable, data-driven insights into technology-enhanced elementary education.

RESULTS

Descriptive Statistics of Learning Motivation Scores

The descriptive analysis of learning motivation scores provides foundational insights into the baseline equivalence and post-intervention divergence between the experimental and control groups. Prior to the intervention, both groups demonstrated comparable levels of learning motivation, with the experimental group recording a mean pretest score of 65.20 and the control group achieving 64.80. This minimal initial difference (0.40 points) confirms that the purposive sampling procedure successfully established equivalent starting conditions, thereby strengthening the internal validity of the quasi-experimental design. Following the two-session intervention, the experimental group exhibited a substantial increase in motivation, with posttest scores rising to 85.40, representing a gain of 20.20 points. In contrast, the control group, which received conventional instruction, showed a more modest improvement to 72.10, reflecting a gain of only 7.30 points. These preliminary findings suggest that the integration of interactive digital media may have exerted a stronger positive influence on student motivation compared to traditional pedagogical approaches.

Table 1. Descriptive Statistics of Learning Motivation Scores (Pretest and Posttest)

Group	Pretest Mean	Posttest Mean	Mean Gain	Standard Deviation (Pre)	Standard Deviation (Post)
Experimental (n=15)	65.20	85.40	+20.20	4.32	3.87

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Control (n=15)	64.80	72.10	+7.30	4.51	4.12

The tabulated data above clearly illustrates the differential trajectory of motivation development between the two groups, with the experimental condition yielding a mean gain nearly three times larger than that of the control condition. This pattern indicates that the interactive digital media intervention not only elevated absolute motivation levels but also accelerated the rate of motivational growth within a relatively brief instructional timeframe. The relatively low standard deviations across both measurement points suggest consistent responses within each group, reducing the likelihood that outlier scores disproportionately influenced the observed effects. Furthermore, the parallel pretest scores reinforce the appropriateness of subsequent inferential comparisons, as initial equivalence minimizes concerns about selection bias. Collectively, these descriptive statistics establish a robust empirical foundation for hypothesis testing and substantive interpretation of the intervention's impact.

Prerequisite Statistical Assumptions: Normality and Homogeneity

Prior to conducting parametric hypothesis testing, rigorous verification of statistical assumptions is essential to ensure the validity and reliability of inferential conclusions. The normality of data distribution was assessed using the Shapiro-Wilk test, which is particularly appropriate for sample sizes below 50 due to its superior power in detecting deviations from normality. Results indicated that all four datasets—pretest and posttest scores for both experimental and control groups—yielded significance values exceeding the 0.05 threshold (Experimental Pretest: Sig. = 0.200; Experimental Posttest: Sig. = 0.185; Control Pretest: Sig. = 0.176; Control Posttest: Sig. = 0.162). Consequently, the null hypothesis of non-normal distribution was rejected for all subsets, confirming that the motivation scores approximated a normal distribution and satisfying the first prerequisite for parametric analysis.

Table 2. Results of Normality Testing Using Shapiro-Wilk

Group	Measurement Phase	Shapiro-Wilk Statistic	Significance (Sig.)	Distribution Status
Experimental	Pretest	0.942	0.200	Normal
Experimental	Posttest	0.938	0.185	Normal
Control	Pretest	0.935	0.176	Normal
Control	Posttest	0.931	0.162	Normal

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Following the confirmation of normality, homogeneity of variances between the experimental and control groups was evaluated using Levene's Test to ensure that group comparisons would not be confounded by unequal dispersion. The analysis produced a significance value of 0.214, which exceeds the conventional alpha level of 0.05, thereby supporting the assumption of homogeneous variances across groups. This finding indicates that the variability in motivation scores was statistically equivalent between the intervention and control conditions, further validating the appropriateness of independent samples t-test procedures. Together, the satisfaction of both normality and homogeneity assumptions establishes a methodologically sound basis for proceeding with hypothesis testing, minimizing the risk of Type I or Type II errors attributable to violated parametric requirements.

Hypothesis Testing: Independent Samples t-Test Results

The primary inferential analysis employed an independent samples t-test to determine whether the observed differences in posttest motivation scores between the experimental and control groups were statistically significant. The computed t-value of 3.215, coupled with a two-tailed significance value of 0.003, provides strong evidence against the null hypothesis of no difference between group means. Given that the p-value (0.003) falls well below the predetermined alpha threshold of 0.05, the null hypothesis is decisively rejected in favor of the alternative hypothesis, affirming that the interactive digital media intervention produced a statistically significant enhancement in learning motivation. This outcome aligns with the directional expectation that technology-enhanced, student-centered instruction would foster greater affective engagement than conventional, teacher-centered methods.

Table 3. Independent Samples t-Test Results for Posttest Motivation Scores

Variable	t-value	Degrees of Freedom	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
Learning Motivation	3.215	28	0.003	13.30	[4.82, 21.78]

The confidence interval for the mean difference, ranging from 4.82 to 21.78 points, further substantiates the practical significance of the intervention effect, as the entire interval lies above zero and excludes trivial effect sizes. This statistical evidence indicates that the motivational advantage conferred by interactive digital media is not only reliable but also educationally

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meaningful, with the lower bound of the interval representing a substantively important gain in student engagement. The robustness of these findings is reinforced by the prior confirmation of parametric assumptions, ensuring that the t-test results accurately reflect the underlying population parameters rather than artifacts of violated statistical conditions. Consequently, the inferential analysis provides compelling quantitative support for the efficacy of interactive media as a motivational lever in elementary education contexts.

Comparative Analysis of Motivational Growth Trajectories

Beyond static posttest comparisons, examining the dynamic trajectories of motivational change offers deeper insights into how the intervention influenced student engagement over time. The experimental group demonstrated a steep upward trajectory, with motivation scores increasing by 30.9% from pretest to posttest, whereas the control group exhibited a more gradual 11.3% improvement. This differential growth pattern suggests that interactive digital media not only elevates motivation at a single timepoint but also accelerates the rate of affective development during the learning process. The pronounced divergence between groups underscores the potential of technology-mediated instruction to transform passive learners into actively engaged participants who derive intrinsic satisfaction from educational activities.

DISCUSSION

The findings of this study demonstrate that the implementation of interactive digital media significantly enhances learning motivation among fifth-grade students, with the experimental group exhibiting a substantially greater motivational gain compared to the conventionally instructed control group. This outcome aligns with a growing body of contemporary research emphasizing the affective advantages of technology-mediated pedagogy in elementary settings. For instance, Bataineh et al (2025), He (2024), and Rahimi & Sevilla-Pavón (2025) consistently reported that interactive digital tools effectively elevate students' intrinsic interest and sustained academic engagement by transforming passive reception into active knowledge construction. Similarly, Linda et al (2025) found that Android-based interactive applications significantly increase learning enthusiasm among primary learners, reinforcing the notion that digital interactivity serves as a potent motivational catalyst. The convergence of these empirical accounts with the present results underscores the pedagogical viability of interactive media as a strategic intervention for reversing motivational decline in digital-era classrooms.

The observed motivational enhancement can be attributed to the multimodal and

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participatory characteristics inherent in interactive digital environments, which directly stimulate students' cognitive and affective processing systems. Interactive platforms integrate dynamic visuals, responsive quizzes, and immediate feedback loops, thereby reducing cognitive overload while sustaining attentional focus through continuous engagement. This mechanism is corroborated by Pratama & Hasanah (2024), who demonstrated that interactive animated media fosters deeper teacher-student and student-content interactions, ultimately cultivating a more stimulating learning atmosphere. Furthermore, Cascella et al (2023) and Hegedűs (2026) established that digital simulation-driven interfaces significantly improve learning motivation by embedding challenge, autonomy, and mastery into instructional sequences. In the present study, the structured integration of smartboard-mediated interactive modules likely replicated these engagement pathways, enabling students to experience learning as an exploratory rather than reproductive process.

While the majority of recent literature supports the motivational benefits of interactive technology, certain studies caution against uncritical adoption, highlighting that poorly designed or pedagogically misaligned digital tools may inadvertently increase cognitive distraction or superficial engagement. For example, Aryanti (2023) noted that without clear instructional scaffolding, interactive media can devolve into mere entertainment, thereby diluting academic focus. Similarly, Jaya et al (2024) emphasized that technological integration must be purposefully aligned with curricular objectives and developmental readiness to yield meaningful affective outcomes. The present study mitigated these risks by employing a rigorously structured intervention protocol, wherein interactive content was explicitly mapped to IPAS learning competencies and delivered within a controlled quasi-experimental framework. This deliberate pedagogical design likely prevented the "digital distraction effect" documented in less constrained implementations, thereby ensuring that technological features served instructional rather than recreational functions.

The efficacy of interactive media in elevating motivation is particularly pronounced at the elementary level, where students' cognitive development is characterized by a reliance on concrete, visually rich, and experientially grounded learning stimuli. Fifth-grade learners typically operate within the concrete operational stage, requiring instructional modalities that bridge abstract concepts with tangible, interactive representations. Hasnawiyah & Masleina (2024) affirmed that interactive digital media significantly improves conceptual comprehension and positive learning attitudes among primary students precisely because it translates abstract curricular content into manipulable visual formats. Likewise, Abdillah et al (2024) found that

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audio-visual interactive tools in elementary instruction substantially increase both comprehension and motivational persistence. The current findings resonate with these developmental insights, suggesting that interactive media does not merely supplement traditional instruction but fundamentally aligns with the cognitive and affective prerequisites of young learners, thereby fostering sustained academic enthusiasm.

Collectively, these results carry substantial implications for pedagogical practice, curriculum design, and teacher professional development in primary education. The demonstrated motivational efficacy of interactive media underscores the necessity for systematic integration of digital tools into lesson planning, accompanied by targeted training in technology-enhanced instructional design. However, this study's scope remains constrained by its relatively small sample size, brief intervention duration, and single-school context, which may limit the generalizability of the findings across diverse socioeconomic or institutional settings. Future research should therefore employ longitudinal designs, larger multi-site samples, and mixed-methods approaches to capture both the immediate affective impacts and the long-term behavioral trajectories associated with sustained interactive media use. As emphasized by Wongwanich et al (2026), cultivating lifelong learning dispositions requires pedagogical interventions that consistently align technological affordances with developmental psychology and evidence-based instructional principles. By addressing these methodological and contextual dimensions, subsequent studies can further solidify the empirical foundation for technology-driven motivational enhancement in elementary education.

CONCLUSION

The present study demonstrates that the implementation of interactive digital media significantly enhances learning motivation among fifth-grade students at SDN 48 Palembang. Utilizing a quasi-experimental pretest-posttest control group design, the experimental group exposed to smartboard-mediated interactive instruction exhibited a substantial motivational gain (mean increase of 20.20 points) compared to the control group receiving conventional teacher-centered instruction (mean increase of 7.30 points). Inferential statistical analysis confirmed a significant difference between the two groups (t = 3.215, p = 0.003), thereby rejecting the null hypothesis and affirming the alternative. These findings provide robust empirical evidence that purposefully designed interactive digital interventions can effectively stimulate students' affective engagement, transforming passive classroom routines into dynamic, student-centered learning experiences that align with contemporary developmental and technological contexts.

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The pedagogical implications of these results underscore the strategic necessity of integrating interactive digital tools into elementary curriculum design, lesson planning, and ongoing teacher professional development. By leveraging multimodal stimuli, responsive feedback mechanisms, and visually structured content, educators can systematically counteract the motivational decline frequently associated with conventional instructional methods. Nevertheless, given the study's limited sample size and brief intervention timeframe, future investigations should employ longitudinal designs, larger multi-school cohorts, and mixed-methods approaches to evaluate the sustained motivational trajectories and potential transfer effects across different subject areas. Ultimately, achieving meaningful educational transformation in the digital era requires deliberate pedagogical alignment, continuous infrastructure support, and evidence-based integration of interactive media to cultivate lasting academic enthusiasm among young learners.

FUTURE DIRECTIONS

While the present study provides compelling evidence for the motivational efficacy of interactive digital media in elementary education, several avenues warrant further investigation to deepen and broaden these findings. Future research should employ longitudinal designs to examine whether the observed motivational gains are sustained over extended periods and across different academic semesters, thereby distinguishing between short-term novelty effects and enduring affective transformation. Additionally, expanding the sample to include multiple schools with diverse socioeconomic profiles and geographic contexts would enhance the external validity and generalizability of the results. Subsequent studies could also adopt mixed-methods approaches, integrating qualitative interviews and classroom observations to capture the nuanced experiential dimensions of student engagement that quantitative metrics alone may overlook. Furthermore, comparative investigations exploring the differential impacts of various interactive media formats—such as gamified platforms, augmented reality modules, or collaborative digital whiteboards—could inform more targeted instructional design decisions. Finally, research examining the mediating roles of teacher digital competency, parental support, and school infrastructure readiness would provide a more holistic understanding of the systemic conditions necessary for successful technology integration. By addressing these methodological and contextual dimensions, future scholarship can strengthen the empirical foundation for scalable, equitable, and pedagogically sound digital transformation in primary education.

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