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Research Article

LEARNERS' ACADEMIC ENGAGEMENT THROUGH TECHNOLOGY: A CASE STUDY

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ABSTRACT

In today's digital age, technology has become an integral part of educational practices, offering new opportunities to enhance student learning. This study investigated how the use of technological devices affects academic engagement among elementary learners in Misamis Occidental Division, Northern Mindanao. The study employed a case study research design (Yin, 2018) and involved three groups of participants: elementary learners, teachers, and parents. Data was gathered using three independent interview guides, each specifically designed for each participant group. The six phases of Yin's (2009) case study procedure guided the systematic collection and analysis of data. The study identified four emerging themes: active engagement through videos and interactive digital tools; distractions from non-educational content; connectivity issues and limited guidance learning through technology; and enhanced understanding through visual and interactive learning. The findings indicate that technology enhances elementary learners' academic engagement and understanding when used purposefully through videos, interactive tools, and multimedia activities. Purposeful integration of videos, interactive tools, and multimedia, combined with reliable connectivity and guided supervision, enhances elementary learners' engagement, understanding, and sustained motivation while minimizing distractions and supporting effective learning. Learners, teachers, and parents may collaboratively and purposefully use, guide, and support educational technology to enhance comprehension and engagement.

Keywords: *academic engagement, digital tools, educational technology, interactive learning, learner support*

Introduction

Bullying S The use of technology in schools has rapidly transformed the global learning environment (Attahakul, 2024; Riveira et al., 2024). Electronic devices such as tablets, smartphones, and laptops are now integral to daily learning experiences, shaping how students learn, communicate, and complete academic tasks (Garlinska et al., 2023; Rehman et al., 2023). This widespread integration of technology has opened new opportunities for creating interactive and engaging learning spaces that promote active learner participation. However, alongside these benefits, concerns have emerged about potential distractions and the negative impact of technology on student motivation and academic performance. As educational institutions and teachers continue to navigate this digital transformation, understanding how the use of technological devices influences students' academic achievement remains a top priority (Ahmad, 2024; Timotheou et al., 2023).

The use of technological devices in primary education has attracted considerable attention due to their widespread deployment among primary learners (Antoninis et al., 2023; Mhlongo et al., 2023). Children at this age are highly susceptible to new technology and tend to use devices for both learning and entertainment purposes. While some research emphasizes the benefits of technology, including increased motivation and access to learning resources, others raise concerns about overuse and potential distractions that may hinder academic progress (Flanigan et al., 2023; Nabung, 2024; Somani et al., 2025). There is a need to study how these devices are used in regular classrooms and extracurricular environments, and the effects on students' participation in learning activities. Such knowledge can help teachers and parents promote the effective use of technology among children.

Current studies, including that by Paradero et al. (2025), have investigated the correlation between elementary students' adoption of technological devices and the extent of their learning engagement. The research employed a descriptive-correlational design in a private school context to investigate how device use impacts various dimensions of engagement. The research revealed that, despite students making extensive use of gadgets for leisure activities, overall engagement remained high, with some dimensions, such as task completion, being significantly influenced by leisure use. The study highlighted the importance of parental regulation in controlling device use to achieve academic objectives. Despite these revelations, the research found that the level of technological device use, primarily for leisure, had a minimal effect on most engagement components.
Although research by Paradero et al. (2025) is informative, there remain limitations in the existing knowledge regarding how certain factors influence the interaction between technology use and academic engagement among elementary school students. The diversity of device use, such as variations in frequency of use, purposes, and parental control, was not fully explored. Second, the research was confined to an independent school environment, which may not be representative of the learning experiences of public-school students or those in multicultural, socioeconomic environments. It is essential to consider how other potential moderating variables, such as student motivation or instructional strategy, influence the use of technological devices and levels of engagement.

This study aimed to fill these gaps by examining a more comprehensive set of variables that influence the interaction between technological device use and academic engagement among elementary students. It aims to examine how various uses of devices, whether educational or recreational, affect students' engagement. The research also aims to investigate how parental control and student motivation influence this relationship. By broadening the scope to encompass public schools and incorporating various factors, this research aims to provide a deeper understanding of the contribution of technology to academic engagement, or its absence. Ultimately, the research can guide the effective integration of technology in primary education, ensuring that digital tools serve as facilitators rather than distractors.

The widespread use of technological devices among young students requires careful consideration of their effect on learning outcomes. Although previous research, such as that by Paradero et al. (2025), has yielded preliminary findings, further work is needed to explore the nuanced dynamics of device utilization, participation, and associated moderating factors. This research, therefore, aimed to contribute to the growing body of literature by providing more in-depth insights into how tech habits affect elementary pupils' academic achievement. The goal is to provide valuable recommendations for teachers, parents, and policymakers to enhance the effectiveness of technology use and foster richer learning experiences. With a sound understanding, stakeholders

can better facilitate young learners in leveraging the advantages of technology while mitigating its potential disadvantages.

The significance of this study lies in its potential to deepen understanding of how technological devices influence elementary students' academic engagement and learning outcomes. While prior research has highlighted both the benefits and challenges of technology use in education, gaps remain in exploring the diversity of device use, including the balance between educational and recreational purposes, frequency of use, and parental regulation. By examining these factors within public-school contexts, this study addresses limitations of earlier studies that focused primarily on private or homogeneous school environments. Its findings can provide evidence-based insights into how technology can be strategically integrated into classrooms to enhance learning, maintain student motivation, and minimize distractions, thereby informing instructional planning and classroom management strategies.

Moreover, this study holds practical significance for parents, teachers, and policymakers in fostering responsible and effective use of technology among young learners. Understanding the interplay of student motivation, parental control, and instructional strategies in moderating the effects of device use can guide the development of policies, programs, and interventions that optimize learning experiences. By generating actionable recommendations, the research aims to help stakeholders create environments where technology serves as a facilitator of academic engagement rather than a source of distraction. Ultimately, the study contributes to the broader discourse on educational technology, offering a comprehensive perspective on how elementary learners can benefit from digital tools while safeguarding their academic performance and holistic development.

Methods

This study employed a case study research design to investigate how technological devices influence academic engagement among elementary learners, allowing an in-depth exploration of the phenomenon within its real-life school context. Conducted in a public elementary school in the Misamis Occidental Division, the research focused on classrooms where technology was actively integrated, gathering data from learners, a teacher, and a parent to capture multiple perspectives on educational and recreational device use, parental control, student motivation, and classroom practices. Using purposive sampling, participants were carefully selected to provide rich, firsthand insights, and three tailored interview guides were employed to elicit detailed information on experiences and perceptions related to technology use and engagement. Ethical considerations, including informed consent, confidentiality, and compliance with the Data Privacy Act of 2012, were rigorously observed to protect participants' rights and ensure a respectful research environment.

Data collection involved face-to-face, audio-recorded interviews supplemented with field notes. In contrast, data analysis followed Yin's six-phase case study procedure, including planning, design, preparation, collection, analysis, and sharing. Themes related to device use patterns, academic engagement, parental involvement, and student motivation were identified through careful coding and interpretation, considering multiple perspectives and alternative explanations. Findings were synthesized into meaningful insights and shared with participants and educational stakeholders to inform practical strategies for effective technology integration. This methodological approach provided a comprehensive understanding of the complex dynamics shaping students' learning experiences, offering evidence-based recommendations for teachers, parents, and policymakers to optimize the use of technological devices in primary education.

Results and Discussions

The study identified four emerging themes, namely: active engagement through videos and interactive digital tools; distractions from non-educational content; connectivity issues; limited guidance that hinders learning through technology; and enhanced understanding through visual and interactive learning.

Theme 1: Active Engagement Through Videos and Interactive Digital Tools

The study revealed that videos, animations, online quizzes, and interactive digital tools significantly enhanced elementary learners' engagement and understanding by combining visual, auditory, and interactive elements, allowing students to actively participate in lessons at their own pace (Mayer, 2023; Zhang & Wang, 2022; Sung et al., 2022). Learners consistently reported that multimedia activities made learning enjoyable, reduced boredom, and supported faster comprehension, while parents and teachers confirmed that purposeful use of interactive technologies sustained attention and motivation (OECD, 2023; Schindler et al., 2023; Hwang, 2023). Grounded in Self-Determination Theory (Ryan & Deci, 2024; Vansteenkiste et al., 2023), the findings indicate that autonomy, competence, and relatedness were fulfilled through technology use, fostering intrinsic motivation and active participation. Collectively, these results underscore that well-designed digital tools, when aligned with learning objectives, are effective in promoting meaningful academic engagement and more profound understanding among elementary learners (Chang, 2024; Prykhodkina et al., 2025; Zamiri & Esmaeili, 2024).

Theme 2: Distractions from Non-Educational Content

The findings highlighted that access to non-educational digital content, including games, social media, and entertainment videos, often distracted learners and reduced focus on academic tasks (Pérez-Juárez et al., 2023; Martin et al., 2025; Politeknik Nusantara Makassar et al., 2025). Students reported difficulties concentrating and completing schoolwork when devices were used for leisure, a concern reinforced by parents and teachers who emphasized the importance of guidance and a purposeful use of technology (Domoff et al., 2020; Uncapher et al., 2017). From a Self-Determination Theory perspective (Ryan & Deci, 2024; Vansteenkiste et al., 2023), distractions from non-educational content undermine learners' autonomy and competence, leading to reduced intrinsic motivation and engagement (Cho et al., 2023; Khan et al., 2024; Taha & Abdulrahman, 2023). These findings illustrate that while technology has the potential to enhance learning, its benefits depend on structured supervision, intentional integration, and monitoring to minimize off-task behavior and maximize academic engagement.

Theme 3: Connectivity Issues and Limited Guidance Hinder Learning Through Technology

Learners' experiences revealed that slow or unreliable internet connections, technical errors, and limited guidance from teachers or parents significantly impeded engagement and task completion in technology-enhanced learning environments (Alqahtani & Rajkhan, 2024; Martin et al., 2025; Hsu et al., 2023). Students reported confusion, stress, and decreased motivation when navigating digital tools without support. At the same time, parents and teachers emphasized that proper guidance and supervision are critical for ensuring technology serves as a learning facilitator rather than a source of distraction (Chen et al., 2023; Domínguez et al., 2024). Consistent with Self-Determination Theory (Ryan & Deci, 2024; Vansteenkiste et al., 2023), unmet psychological needs for competence and relatedness due to connectivity issues or a lack of guidance reduced intrinsic motivation and academic engagement (Ibraheem, 2023; Khan et al., 2024). These findings underscore the importance of combining reliable technical infrastructure with structured support to enhance learners' digital literacy, sustain attention, and promote meaningful participation in technology-mediated classrooms (Almaiah et al., 2023; Rahman et al., 2023; Zhou et al., 2023).

Theme 4: Enhanced Understanding Through Visual and Interactive Learning

The study indicated that visual and interactive learning tools, including videos, animations, diagrams, and digital quizzes, substantially improved learners' comprehension, retention, and engagement by presenting content through multiple sensory channels (Mayer, 2021; Fiorella & Mayer, 2022; Schindler et al., 2020). Learners consistently reported that multimedia and interactive activities facilitated faster understanding, sustained attention, and greater enjoyment, while parents and teachers confirmed the effectiveness of these tools in supporting lesson comprehension and motivation (Bond et al., 2020; Hew et al., 2021; Chang, 2024). Guided by the Cognitive Theory of Multimedia Learning (Mayer, 2021), these findings suggest that dual-channel processing of visual and auditory content enhances cognitive involvement, active participation, and problem-solving skills (Fiorella & Mayer, 2022; Bond et al., 2020; Clark & Mayer, 2023). Overall, the results highlight that purposeful integration of visual and interactive tools promotes both individual and collaborative learning,

supporting compelling, engaging, and student-centered technology-enhanced classrooms (Zhang & Wang, 2022; Li et al., 2023).

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Conclusions

Purposefully integrating videos and interactive digital tools, supported by structured guidance from teachers and parents, enhances elementary learners' understanding, attention, and motivation while fostering sustained academic engagement. Effective technology use requires minimizing distractions from non-educational content through supervision, ensuring reliable connectivity, and providing clear instructional support, all of which maximize the benefits of digital tools in promoting active participation, more profound comprehension, and meaningful learning outcomes in classroom activities.

Recommendations

Learners, teachers, and parents play complementary roles in maximizing the educational benefits of technology. Learners are encouraged to focus on lesson-related content, actively engage with videos, animations, interactive activities, and multimedia tools, and seek guidance when needed to minimize distractions and strengthen comprehension and academic performance. Parents are vital in monitoring, supervising, and supporting their children's use of digital devices at home, ensuring technology is used purposefully for learning and providing timely assistance with technical challenges. Teachers can intentionally integrate multimedia resources, interactive activities, and collaborative digital tools into lessons while offering structured guidance, scaffolding, and clear instructions to enhance understanding, motivation, and sustained engagement. The purposeful collaboration among learners, parents, and teachers fosters meaningful, focused, and effective technology-enhanced learning experiences.

Conflict of Interests

The author declares that they have no conflicts of interest

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