

Information Technology Integration and Classroom Learning Engagement in Selected Elementary Schools in Binangonan, Rizal



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ABSTRACT: The objective of this study is to assess the correlation of information technology integration on the learning engagement of grade school pupils in selected elementary schools in Binangonan, Rizal. In an era where technological advancements are rapidly transforming educational landscapes, this study investigates how effectively integrating information technology (IT) into teaching practices impacts various dimensions of pupil engagement, including emotional, cognitive, motivational, behavioral, cognitive-behavioral, and social-behavioral engagement.

The research sample consists of 655 pupils, highlighting a slight predominance of females over males and revealing significant socioeconomic diversity among the respondents. The study employs a comprehensive approach, evaluating teachers' proficiency in multiple domains of IT integration—Technological Knowledge, Content Knowledge, Pedagogical Knowledge, Pedagogical Content Knowledge, Technological Content Knowledge, Technological Pedagogical Knowledge, and Technological Pedagogical Content Knowledge.

Findings indicate a consistently high level of IT integration across these domains, with slight variances based on factors such as sex, family income, and access to technology at home. Emotional and cognitive engagement among pupils are particularly influenced by these variables, while overall engagement levels remain robust across different demographics. The study also reveals significant positive correlations between teachers' IT integration and pupils' engagement across all dimensions, underscoring the critical role of proficient IT use in enhancing educational outcomes.

Based on these insights, the study proposes an Enhanced Training Plan aimed at addressing the digital divide, empowering teachers through continuous professional development, fostering high levels of pupil engagement, and promoting collaborative and supportive classroom environments. This plan includes targeted activities, regular monitoring, and evaluation to ensure its effectiveness and adaptability to evolving educational needs. The findings highlight the necessity for ongoing support and professional development for teachers to maximize the benefits of IT integration, ultimately contributing to a more dynamic and inclusive educational experience for all pupils.

KEYWORDS: information technology integration, classroom learning engagement, technological knowledge, content knowledge, pedagogical knowledge, technological pedagogical content knowledge, emotional engagement, cognitive engagement, motivational engagement, behavioral engagement, cognitive-behavioral engagement, social-behavioral engagement

I. INTRODUCTION

In the ever-evolving landscape of education, the integration of information technology has emerged as a pivotal catalyst for transforming classroom dynamics and enhancing the learning experience. As educational institutions adapt to the demands of the digital age, understanding the intricate interplay between technology integration and student learning engagement becomes paramount. This study embarks on a journey to investigate this intricate relationship within the context of a selected elementary school in Binangonan, Rizal.

The significance of technology in education cannot be overstated. It offers a multitude of tools and resources that can engage, motivate, and empower students. However, the mere presence of technology in the classroom does not guarantee improved educational outcomes. To harness its full potential, educators must possess the requisite technological knowledge and pedagogical skills to effectively integrate technology into their teaching practices. Simultaneously, it is crucial to consider the diverse profiles of grade school pupils, as factors such as gender, grade level, family income, and access to technology can influence their learning experiences.

This research builds upon a rich foundation of literature that underscores the multifaceted nature of engagement in the learning process. Pekrun and Linnenbrink-Garcia (2012) delineate various dimensions of engagement, including emotional, cognitive,

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motivational, behavioral, cognitive-behavioral, and social-behavioral engagement. These dimensions collectively contribute to a holistic understanding of how students engage with their learning environment, encompassing their feelings, cognitive processes, motivation, actions, and social interactions.

Furthermore, the Technological Pedagogical Content Knowledge (TPACK) framework proposed by Rodriguez Moreno, Agreda Montoro, and Ortiz Colón (2019) elucidates the components and variables relevant to technology integration in education. This framework emphasizes the critical role of teachers' technological knowledge, pedagogical knowledge, and content knowledge in shaping the effectiveness of technology integration.

While the literature explores the individual domains of technology integration and learning engagement, there remains a critical gap in understanding how these domains intersect, particularly in the context of grade school education. This study aims to address this gap by quantitatively examining the extent of teachers' technology integration knowledge and its correlation with the level of learning engagement among grade school pupils.

By exploring the connections between these variables, this research endeavors to provide empirical evidence that can inform educational practices and guide the development of an enhanced training plan. Such a plan can empower educators with the necessary skills to navigate the digital landscape effectively, thus fostering an engaging and inclusive learning environment for grade school pupils.

Research Question

Is there correlation between the extent of teachers' implementation of information technology integration and level of classroom learning engagement of the grade school pupils?

II. METHODOLOGY

The study aims to assess the correlation of information technology integration on the classroom learning engagement of grade school pupils in selected elementary schools in Binangonan, Rizal. It utilized a researcher-made questionnaire, validated and undergo the reliability testing (Cronbach's alpha = 0.992). The research design for this study was a quantitative comparative correlational design that allows for the examination of relationships and differences between variables, specifically focusing on the extent of teachers' implementation of information technology integration and the level of classroom learning engagement of grade school pupils.

III. RESULT AND DISCUSSION

Table 1. Correlation Between Teachers' Implementation of Information Technology Integration and Level of Classroom Learning Engagement of Grade School Pupils

Indicator	Pearson Correlation	Sig. (2-tailed)	Decision	Interpretation
Teachers' Implementation of Information Technology Integration and Level of Classroom Learning Engagement of Grade School Pupils	0.636	0.000	Rejected	Significant

The implementation of information technology integration by teachers shows a strong and significant correlation with the overall learning engagement of grade school pupils ($r = .636$, $p = .000$). This finding highlights the critical impact of effective IT integration in teaching on enhancing pupil engagement across emotional, cognitive, motivational, behavioral, cognitive-behavioral, and social-behavioral dimensions. It suggests that teachers who skillfully incorporate technology into their teaching practices can significantly enhance pupils' emotional, cognitive, motivational, behavioral, cognitive-behavioral, and social-behavioral engagement. This finding underscores the need for ongoing professional development and support for teachers in using technology effectively to maximize pupil engagement and learning outcomes.

Engagement in the classroom is also being recognized through innovative technologies, such as video analysis and deep learning algorithms. Hu et al. (2022) developed a bimodal learning engagement recognition method that utilizes non-invasive classroom videos. Their approach achieved a high level of accuracy, showcasing the potential of artificial intelligence in assessing and understanding students' engagement in the classroom. This demonstrates the evolving landscape of engagement assessment through technology (Hu et al., 2022).

Additionally, advancements in machine learning and computer vision are contributing to the assessment of students' visible engagement in the classroom. Goldberg et al. (2019) explored a machine vision-based approach that analyzed students' gaze, head pose, and facial expressions to assess their engagement. The study found correlations between automated analyses and manual ratings of engagement, suggesting the potential of machine learning in evaluating students' visible engagement in the classroom (Goldberg et al., 2019).

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Moreover, the use of technology-enhanced classrooms, such as hybrid virtual classrooms, is gaining prominence. Raes et al. (2020) conducted an experiment comparing different learning settings, including face-to-face and virtual, in pure and hybrid environments. They found that relatedness and intrinsic motivation were lowest in the hybrid-virtual setting, emphasizing the challenges of remote learning. However, the study highlighted the positive impact of quizzes on students' motivation, indicating the potential for technology-enhanced engagement strategies.

IV. CONCLUSION

The correlation analysis reveals significant positive relationships between teachers' IT integration and pupil engagement across all dimensions. Teachers' proficiency with technology enhances emotional, cognitive, motivational, behavioral, cognitive-behavioral, and social-behavioral engagement. Effective IT integration creates an interactive and engaging learning environment, underscoring the need for ongoing professional development and support for teachers in using technology effectively to maximize pupil engagement and learning outcomes.

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