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Digital Versus Print Literacy Interventions: A Comprehensive Analysis of Impact and Effectiveness

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ABSTRACT

This study examined the comparative effectiveness of printed and digital literacy interventions in improving reading comprehension and academic performance among Grade 11 students at Immaculada Concepcion College, Caloocan City, during the school year 2023–2024. Anchored in Transactional Theory and the Input-Process-Output conceptual framework, the study employed a descriptive quantitative research design involving 100 respondents selected through total population sampling. Data were collected using the Philippine Informal Reading Inventory, pretest and posttest assessments, and an adopted survey questionnaire administered through Google Forms. Weighted mean, independent samples t-test, and multiple regression analysis were employed. Findings revealed improvements in reading comprehension, accuracy, and fluency following both interventions. Digital literacy interventions produced significantly higher posttest scores in comprehension (6.00 versus 4.96, $p = 0.001$) and accuracy and fluency (1.98 versus 1.68, $p < 0.001$) compared with printed interventions. Digital instruction also enabled some students to attain independent reading proficiency, while printed instruction supported foundational reading development. Students generally demonstrated satisfactory to very satisfactory academic performance and valued printed materials for concentration and comprehension, although they spent more time reading digitally. Motivation toward digital reading assignments remained comparatively low. Neither intervention significantly predicted academic performance ($p = 0.532$), indicating limited explanatory power. The study recommended integrating printed and digital materials through differentiated instruction, teacher development, targeted support, and continuous assessment. It primarily supports Sustainable Development Goal 4 (Quality Education) and relates to SDG 9 (Industry, Innovation and Infrastructure) through educational technology integration, with potential relevance to SDG 12 (Responsible Consumption and Production) in instructional resource selection. Its sustainability contribution lies in strengthening institutional literacy practices, promoting accessible learning opportunities, and supporting evidence-based educational resource planning rather than demonstrating direct environmental benefits.

Keywords: *Academic Performance, Digital Literacy Interventions, Educational Technology, Printed Literacy Interventions, Quality Education, Reading Comprehension, Reading Fluency, Sustainable Development Goals*

1. INTRODUCTION

Literacy is a fundamental competency encompassing reading, writing, comprehension, critical thinking, and communication. In an increasingly digital society, literacy extends beyond traditional printed materials to include digital and media literacy, lifelong learning, and competencies necessary for meaningful participation in education and society (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2024). Technological advancements have transformed reading practices, introducing digital platforms alongside conventional printed texts and creating new opportunities and challenges for literacy instruction. Printed materials remain important for sustained attention, comprehension, and meaningful engagement, while digital resources provide accessibility, interactivity, and flexible learning experiences. Although traditional books continue to be widely used (Hare et al., 2024), the increasing integration of digital technologies into education has raised questions about the comparative effectiveness of these reading formats. Research has reported advantages for printed reading in comprehension and attention (Hare et al., 2024), while other findings emphasize the importance of learner engagement and metacognitive monitoring when using digital materials (Li & Yan, 2024). This study, conducted among Grade 11 students at Immaculada Concepcion College, Caloocan City, during the school year 2023–2024, examined the impact and effectiveness of digital and printed literacy interventions on reading comprehension and academic performance in English. By comparing students' reading performance, perceptions, and learning outcomes, the study sought to provide evidence for improving literacy instruction and developing appropriate reading intervention strategies.

Research Problem

Despite global improvements in literacy, substantial challenges remain in developing reading comprehension and critical literacy skills. UNESCO (2024) reported that 763 million adults lacked basic literacy competencies, while the Philippines continued to demonstrate difficulties in international educational assessments. The 2022 Programme for International Student Assessment results placed the Philippines 77th among 81 participating countries in reading, mathematics, and science (OECD, 2023). These concerns highlight the need for effective interventions that strengthen students' ability to interpret, evaluate, and communicate information. The increasing adoption of digital learning resources has complicated the selection of appropriate reading interventions. Digital platforms offer convenient access to information and interactive content, contributing to the transition toward paperless educational environments (UNESCO, 2024). However, effective digital reading requires instructional guidance, appropriate learning strategies, and meaningful interaction with texts (Yang, 2023). Although students generally demonstrate positive attitudes toward digital reading, screen brightness and related discomfort may affect their experiences (Hare et al., 2024). Research comparing digital and printed reading has produced inconsistent findings. Some investigations associate digital reading with reduced comprehension, distraction, and weaker cognitive engagement (Hare et al., 2024). Printed materials, conversely, support tactile interaction, sustained concentration, and deeper comprehension (Hare et al., 2024). Physical interaction with printed books also provides sensory information that may strengthen readers' understanding and engagement (Hare et al., 2024). Other studies emphasize the influence of reading proficiency and cognitive demands on performance across different formats (Li & Yan, 2024). The effectiveness of reading formats remains dependent on technological familiarity, reading strategies, and individual learning characteristics (Li & Yan, 2024). Screen-based reading has been associated with increased mind wandering and reduced comprehension (Hare et al., 2024), particularly when digital activities introduce distractions or limit comprehension monitoring (Salmerón et al., 2023; Hare et al., 2024). Altamura et al. (2026) further examined the effects of reading media and multitasking on comprehension and metacomprehension when

reading multiple texts, highlighting the importance of considering attentional demands and reading conditions when evaluating digital and printed reading experiences. Multimedia features may also interfere with comprehension when they divert attention from the central text (Hare et al., 2024). Conversely, digital interventions have demonstrated potential for improving reading motivation, vocabulary, and comprehension. Research involving digital instructional resources has reported improvements in literacy outcomes (Corales, 2023; Fitriani and Sunarti, 2024). However, printed instructional materials remain effective in supporting learning, particularly where technological resources are limited (Balangue, 2024). These contrasting findings indicate the need for a contextualized comparison of digital and printed literacy interventions. The central research problem concerns which reading format more effectively improves students' comprehension and academic performance and whether the use of these interventions significantly predicts literacy outcomes. Addressing this problem may support teachers and administrators in selecting appropriate reading resources and instructional approaches.

Assumptions of the Study

The study was guided by the premise that both printed and digital literacy interventions can influence students' reading performance, comprehension, and engagement, although their effectiveness may differ according to the characteristics of the reading medium and learners' experiences. Printed materials were considered potentially beneficial for focused reading, comprehension, and reduced distraction. Their physical characteristics provide spatial and tactile cues that support engagement with texts (Hare et al., 2024; Taylor Corporation, 2024). Research also suggests that printed reading may offer advantages for comprehension, particularly when sustained attention and interpretation are required (Altamura et al., 2025; Hare et al., 2024). Digital materials, meanwhile, were considered potentially beneficial because of their accessibility, portability, multimedia features, and interactive learning opportunities (Richmond Solution, 2023). Digital annotation and collaborative activities may facilitate active engagement and critical thinking (Yang, 2023). However, the effectiveness of these resources may depend on students' digital proficiency, familiarity with technology, and reading strategies. The study formally tested two null hypotheses: first, that no significant difference exists in students' reading performance between digital and printed literacy interventions based on pretest and posttest results; and second, that the use of printed and digital literacy interventions does not significantly predict students' comprehension levels. These hypotheses provided the basis for evaluating the comparative effectiveness of the interventions without presuming that either format would produce superior outcomes.

Objectives of the Study

The general objective of the study was to determine and compare the impact and effectiveness of printed and digital literacy interventions on the reading comprehension and academic performance of Grade 11 students at Immaculada Concepcion College during the school year 2023–2024. Specifically, the study sought to determine students' reading performance before and after exposure to printed and digital literacy interventions; assess their academic performance in English; examine their perceptions of the advantages of both reading formats; identify significant differences in posttest reading performance between the interventions; determine the extent to which printed and digital literacy interventions predict comprehension levels; and propose an action plan to enhance reading comprehension and academic performance based on the findings. These objectives respond to the need for instructional strategies that accommodate different reading abilities and learning preferences. Previous investigations have identified difficulties in reading comprehension, higher-order thinking, and academic literacy, emphasizing the importance of targeted educational interventions (Sangilan and Naparota, 2025; Balangue, 2024; Mallillin, 2025).

Conceptual and Theoretical Framework

The study was anchored in Transactional Theory (Rosenblatt, 1978), which explains reading as an active process of meaning construction through interaction between the reader and the text. Comprehension develops as readers integrate textual information with prior knowledge, personal experiences, interpretations, and critical reflection. This perspective recognizes that effective reading involves more than decoding words; it requires meaningful engagement and active interpretation. Transactional Theory supports printed literacy interventions through personal reflection, discussion, annotation, and interpretation of texts. It also provides a foundation for digital literacy interventions that encourage interactive reading, collaborative annotation, multimedia interpretation, and communication among learners. The increasing availability of nonlinear and interactive digital texts further emphasizes the changing relationship between readers and reading materials (Kesterson, 2015, as cited in Hare et al., 2024). The study also employed the Input-Process-Output (IPO) model as its conceptual framework. The inputs included printed and digital literacy interventions, students' reading performance, academic achievement, and perceptions of the advantages of both formats. The process involved data gathering, statistical analysis, interpretation, and reporting, while the intended output was enhanced reading comprehension and academic performance through an evidence-based intervention plan. This framework was supported by studies examining the cognitive and instructional differences between reading formats. Printed reading has been associated with stronger comprehension, concentration, and tactile engagement (Hare et al., 2024; Ofgang, 2023). Nevertheless, differences in reading speed, attentional demands, and comprehension may vary according to students' abilities and reading conditions (Li & Yan, 2024). Empirical evidence also demonstrates that neither format is universally superior. Digital teaching materials have produced improvements in literacy performance (Saputra et al., 2024), while comparative research has found no substantial overall difference in comprehension between digital and printed reading under certain conditions (Li & Yan, 2024). Other investigations have reported advantages for printed materials in comprehension and engagement (Belhida et al., 2025; Hare et al., 2024). Research has further emphasized the need to examine digital proficiency, cognitive load, and reading conditions when evaluating instructional effectiveness (Hare et al., 2024). Studies comparing printed and digital reading materials have highlighted the importance of evaluating reading comprehension across different instructional formats (Hare et al., 2024; Li & Yan, 2024). Furthermore, Belhida et al. (2025) reported advantages of printed reading materials in students' comprehension performance, while Li and Yan (2024) emphasized that reading outcomes may vary depending on learners' characteristics and reading conditions. These findings underscore the importance of considering both reading formats when developing literacy interventions to address students' diverse learning needs. The relationship between reading format and comprehension has also been examined in local and foreign educational contexts. Printed reading has demonstrated advantages in comprehension tasks requiring inference and critical thinking, whereas digital formats provide greater convenience and accessibility (Abellanoza et al., 2025; Li & Yan, 2024). The continued development of digital technologies has therefore intensified the need to understand their implications for reading instruction and academic performance (Sudarsih, 2024). Taken together, Transactional Theory and the IPO model provide complementary foundations for the study. Transactional Theory explains how students construct meaning through interactions with printed and digital texts, while the IPO model organizes the evaluation of interventions and their intended learning outcomes.

Sustainable Development Goal and Multidisciplinary Sustainability Relevance

The study primarily aligns with Sustainable Development Goal 4 (Quality Education), which promotes inclusive, equitable, and quality education and lifelong learning opportunities. Its emphasis on improving reading comprehension, literacy proficiency, and academic

performance directly supports educational sustainability by identifying effective instructional strategies for developing essential learning competencies. The research recognizes literacy as an evolving competency that includes digital skills, media literacy, and education for sustainable development (UNESCO, 2024). By comparing printed and digital interventions, the study contributes to understanding how different educational resources may support literacy development and improve teaching practices. The study also relates to SDG 9 (Industry, Innovation and Infrastructure) through its examination of digital technologies as instructional resources. Digital reading platforms offer opportunities for interactive learning, access to educational content, and the development of technological competencies. Evaluating their effectiveness alongside printed materials supports the informed integration of educational innovations without disregarding conventional learning resources. A further connection exists with SDG 12 (Responsible Consumption and Production) through the consideration of digital alternatives to printed reading materials. Digital resources may reduce reliance on physical reading materials, although the study does not directly assess environmental impacts, resource consumption, or the comparative sustainability of the two formats. Consequently, this connection is limited to the potential implications of instructional material selection rather than a demonstrated environmental benefit. Overall, the study contributes primarily to educational and technological sustainability by providing a basis for selecting appropriate literacy interventions, strengthening reading comprehension, and informing instructional planning. Its findings may assist teachers and school administrators in developing balanced, accessible, and effective reading programs that respond to students' learning needs while supporting quality education.

2. METHODOLOGY

Research Design

The study utilized a descriptive quantitative research design to assess and compare the effectiveness of digital and printed literacy interventions. This design involves collecting and analyzing numerical data to describe characteristics, identify patterns, and examine relationships among variables without manipulating them (Creswell & Creswell, 2020). It was considered appropriate for evaluating students' reading performance through pretest and posttest assessments, reading comprehension measures, and survey responses. The approach enabled an objective comparison of literacy outcomes and the identification of statistically significant differences between the two interventions.

Research Locale or Study Setting

The study was conducted at Immaculada Concepcion College in Caloocan City, Philippines, during the school year 2023–2024. The research focused on Grade 11 students enrolled in a reading intervention class where both digital and printed literacy materials were utilized. This setting provided an opportunity to examine students' reading comprehension, academic performance, and perceptions of the two instructional formats within their existing educational environment.

Participants or Data Sources

The study population consisted of 108 Grade 11 students enrolled in the reading intervention class at Immaculada Concepcion College, of whom 100 were identified as respondents. The researcher employed total population sampling, a form of purposive sampling intended to include all individuals sharing a specific characteristic, particularly participation in the reading intervention class. The respondents represented varying levels of academic performance, socioeconomic backgrounds, and access to technology. Their exposure to digital and printed reading materials provided the basis for comparing the effectiveness of both literacy interventions.

Research Instruments or Materials

The Philippine Informal Reading Inventory (PhilIRI) was utilized to assess students' reading proficiency and comprehension before and after the implementation of digital and printed literacy interventions. This instrument evaluated students' ability to decode and understand texts and provided a basis for measuring changes in reading performance. Students' perceptions of the advantages of both interventions were assessed using an adopted questionnaire (Abbas et al., 2024) from the study Investigating the Impact of Digital vs. Traditional Reading Habits on Comprehension and Engagement Among Middle School Students. The questionnaire was administered through Google Forms. The instrument underwent expert validation by a graduate school professor, an English coordinator, a school head, and a research specialist to establish its appropriateness, clarity, and relevance. Recommended revisions were incorporated before administration. Reliability was assessed through pilot testing involving selected Grade 10 students who were excluded from the main study. Cronbach's alpha was used to determine the questionnaire's internal consistency, with values above 0.70 generally indicating acceptable reliability.

Data Gathering Procedure

Data collection began with a formal request for permission addressed to the school principal. Following the principal's endorsement, approval was obtained from the Schools Division Superintendent. The researcher subsequently requested the participation of selected respondents through a letter explaining the study's purpose, procedures, and ethical considerations. Data gathering commenced after the necessary approvals and participant permissions had been secured. The survey questionnaire was prepared using Google Forms and distributed to respondents through email or messaging platforms. Completed responses were automatically recorded and subsequently exported to Microsoft Excel. The researcher organized, encoded, reviewed, and cleaned the collected data to ensure accuracy and consistency before statistical analysis. Reading performance data obtained through the literacy assessments were used to evaluate the effectiveness of the printed and digital interventions.

Data Analysis

The collected data were analyzed using descriptive and inferential statistical methods. The weighted mean was employed to summarize students' responses to individual questionnaire items and determine overall perceptions of the literacy interventions. An independent samples t-test was used to examine significant differences in reading performance between students exposed to printed and digital literacy interventions based on pretest and posttest results. Multiple regression analysis was applied to determine the extent to which printed and digital literacy interventions predicted students' comprehension levels and academic performance. This analysis examined the relationships between the interventions as independent variables and students' learning outcomes as dependent variables. These statistical procedures provided the basis for interpreting the comparative effectiveness of both reading formats.

Ethical Consideration

The study observed ethical principles to protect the rights, safety, privacy, and well-being of participants, particularly because the respondents were Grade 11 students who were minors. Written informed consent was obtained from the students and their parents or guardians. Participants were informed of the study's objectives, procedures, and expected duration, and their participation was voluntary, with the right to withdraw at any time without penalty. Confidentiality and data privacy were maintained throughout the research process. Personal identifiers were not recorded or disclosed, and collected information was anonymized and securely stored in accordance with applicable data privacy requirements. Access to the data was

restricted to the researcher, and findings were presented in aggregated form to protect respondents' identities. The research procedures were designed to be age-appropriate and to minimize potential discomfort or distress. The study adhered to the ethical principles of respect for autonomy, beneficence, non-maleficence, and justice, ensuring that participants' rights and welfare remained central throughout the investigation.

3. RESULTS AND DISCUSSION

3.1 Reading Performance Following Printed and Digital Literacy Interventions

3.1.1 Reading Performance Before and After Printed Literacy Intervention

The results showed improvement in students' reading comprehension and accuracy and fluency following the printed literacy intervention. The mean comprehension score increased from 3.98 in the pretest to 4.96 in the posttest, while the mean accuracy and fluency score increased from 1.56 to 1.68. The number of students at the frustration level decreased from 54 to 40 in comprehension and from 44 to 32 in accuracy and fluency. However, no students reached the independent reading level after the intervention. These findings indicate improved reading performance, although students continued to require instructional support. The improvement suggests that printed literacy interventions can strengthen foundational reading skills, particularly among students experiencing comprehension difficulties. However, the absence of independent readers indicates the need for continued intervention and differentiated instruction. Belhida et al. (2025) reported higher comprehension scores among students using printed materials than those using digital resources. Similarly, Balangue (2024) found that printed Strategic Intervention Materials improved academic performance. These findings are further supported by Hare et al. (2024), who identified advantages of printed reading materials in supporting reading comprehension and sustained attention.

3.1.2 Reading Performance Before and After Digital Literacy Intervention

The digital literacy intervention produced improvements in students' reading comprehension and proficiency levels. The mean comprehension score increased from 4.34 in the pretest to 6.00 in the posttest. Students classified at the independent level increased from none to 14 in comprehension and from none to 20 in accuracy and fluency. Meanwhile, the number of students at the frustration level decreased from 40 to 32 in comprehension and from 38 to 24 in accuracy and fluency. The reported posttest mean for accuracy and fluency was 1.98, compared with a recorded pretest mean of 16.20. Overall, the changes in proficiency classifications indicate improved reading performance following the digital intervention. These findings suggest that digital literacy interventions can support reading development by helping students progress from frustration and instructional levels toward independent reading. Interactive resources and adaptable learning materials may contribute to improved comprehension and fluency. Corales (2023) similarly reported improvements in students' reading comprehension and fluency following exposure to digital reading resources. Sudarsih (2024) emphasized the changing role of digital technology in literature instruction, particularly its implications for comprehension and critical thinking. Likewise, Saputra et al. (2024) found that digital learning materials improved literary literacy skills and produced greater academic gains than traditional printed resources.

3.2 Academic Performance and Students' Perceptions of Literacy Interventions

3.2.1 Academic Performance in English

The results indicated that most students demonstrated favorable academic performance in English. The largest proportion was classified as Very Satisfactory, comprising 46 students or

45.5%, followed by 28 students or 27.7% classified as Satisfactory. Meanwhile, 14 students or 13.9% achieved Outstanding performance, while 13 students or 12.9% were classified as Fairly Satisfactory. These results show that most respondents achieved satisfactory to outstanding academic performance, although a smaller group continued to experience learning difficulties. The distribution of academic performance indicates varying levels of proficiency and the need for differentiated instructional support. Students with lower achievement may benefit from remediation, guided instruction, and structured learning materials, while higher-performing students may require enrichment activities. Balangue (2024) emphasized the effectiveness of customized educational materials, particularly worksheets, in addressing individual deficiencies in English proficiency. These findings support the importance of targeted interventions that respond to students' different learning needs.

3.2.2 Students' Perceptions of Printed and Digital Literacy Interventions

Students generally expressed favorable perceptions of printed and digital literacy interventions, with an overall weighted mean of 2.89 and a standard deviation of 0.62. Printed materials received the highest agreement for supporting concentration and comprehension (M = 3.14, SD = 0.57). Students also reported spending more time reading on digital devices than printed materials (M = 3.13, SD = 0.66). However, they disagreed that digital assignments increased their motivation to begin and complete reading tasks (M = 2.44, SD = 0.50). These findings indicate that students recognized the accessibility of digital reading while continuing to value printed materials for focused comprehension. The findings suggest that greater exposure to digital reading does not necessarily translate into stronger motivation or perceived comprehension. Printed materials may provide fewer distractions and support sustained attention, whereas digital resources offer accessibility and interactive features. Abellanoza et al. (2025) emphasized that both reading formats have distinct advantages, with printed materials demonstrating stronger comprehension outcomes. Furthermore, Altamura et al. (2025) conducted a meta-analysis examining the relationship between leisure digital reading habits and text comprehension, highlighting the importance of considering how digital reading practices relate to students' comprehension outcomes. These findings support the integration of both formats to accommodate different learning preferences and instructional requirements.

3.3 Comparative Effectiveness and Relationship Between Literacy Interventions and Academic Performance

3.3.1 Significant Differences in Posttest Reading Performance

The independent samples t-test revealed statistically significant differences in posttest reading performance between the printed and digital literacy intervention groups. For reading comprehension, the digital intervention obtained a higher mean score of 6.00 than the printed intervention, which recorded 4.96, representing a mean difference of 1.04 points ($t = -4.551$, $df = 98$, $p = 0.001$). Similarly, the digital intervention achieved a higher mean score in accuracy and fluency (1.98) than the printed intervention (1.68), with a mean difference of 0.30 ($t = -13.99$, $df = 98$, $p < 0.001$). Both differences were statistically significant at the 0.05 level, resulting in the rejection of the null hypothesis. These findings indicate that the digital intervention group achieved significantly higher posttest reading performance than the printed intervention group. The results suggest that digital literacy interventions may offer advantages in improving reading comprehension, accuracy, and fluency when appropriately incorporated into classroom instruction. Digital resources can support student engagement through interactive content, multimedia features, and personalized learning opportunities. Nevertheless, the findings also

recognize the continuing importance of printed materials in promoting concentration and foundational literacy development. Mallillin (2025) similarly reported that digital instructional strategies enhanced students' vocabulary acquisition and reading comprehension. These findings support a balanced instructional approach that incorporates the strengths of both reading formats.

3.3.2 Predictive Relationship Between Literacy Interventions and Academic Performance

Multiple regression analysis revealed that printed and digital literacy interventions did not significantly predict students' academic performance in English. The overall regression model was not statistically significant, $F(2, 97) = 0.64$, $p = 0.532$, and explained only 2% of the variance in academic performance ($R^2 = 0.02$). Printed literacy intervention demonstrated a small negative coefficient ($B = -0.022$, $\beta = -0.037$, $p = 0.798$), while digital literacy intervention showed a weak positive coefficient ($B = 0.088$, $\beta = 0.153$, $p = 0.297$). Neither predictor reached statistical significance, resulting in the retention of the null hypothesis. These findings indicate that although digital literacy interventions demonstrated a more favorable relationship with academic performance than printed interventions, neither reading format independently predicted academic achievement at a statistically significant level. The limited explanatory power of the model suggests that academic performance may also be influenced by other learning-related factors, including study habits, prior knowledge, instructional practices, and student engagement. Li and Yan (2024) emphasized that reading comprehension depends on learners' interaction with texts and their reading strategies rather than solely on whether materials are presented digitally or in print. The findings therefore highlight the importance of considering broader instructional and learner-related factors when evaluating academic outcomes.

3.4 Proposed Action Plan to Enhance Reading Comprehension and Academic Performance

3.4.1 Integration of Printed and Digital Literacy Interventions

Based on the findings, the researcher proposed an action plan integrating printed and digital literacy interventions to improve students' reading comprehension and academic performance. The plan includes structured printed reading modules, guided reading sessions, remedial instruction, e-books, interactive digital platforms, multimedia resources, and gamified learning activities. It also incorporates differentiated instruction, blended learning strategies, peer tutoring, and regular formative assessments. The proposed interventions are intended to address students' varying reading proficiency levels, strengthen comprehension and fluency, and encourage independent reading. The proposed approach recognizes the complementary benefits of printed and digital learning materials. Printed resources remain important for developing concentration and comprehension, while digital platforms offer opportunities for interactive and personalized instruction. Combining these resources may help teachers respond to individual learning needs and promote greater participation in reading activities. The proposed action plan therefore emphasizes the deliberate selection of instructional materials rather than exclusive reliance on a single reading format.

3.4.2 Teacher Development, Student Support, and Progress Monitoring

The proposed action plan also emphasizes teacher capacity building, student motivation, and continuous evaluation of literacy interventions. Recommended activities include professional development workshops, coaching and mentoring, collaborative learning sessions, reading goal-

setting, individualized feedback, and regular monitoring of student progress. The plan identifies English teachers, school administrators, reading coordinators, ICT personnel, guidance counselors, and parents as key participants in implementing these activities. It also recommends strengthening home-school partnerships and providing academic support services to address factors affecting student achievement. These measures are intended to support the consistent implementation and evaluation of literacy interventions. Teacher training may strengthen the effective use of printed and digital resources, while regular assessments can help identify students requiring additional support. Parental involvement, counseling, and academic assistance may also contribute to a more responsive learning environment. The proposed action plan provides a framework for improving literacy instruction through coordinated school initiatives, continuous monitoring, and adjustments based on students' learning needs.

4. CONCLUSIONS AND RECOMMENDATIONS

The study concluded that both printed and digital literacy interventions improved students' reading comprehension, accuracy, and fluency, although digital interventions demonstrated significantly greater effectiveness. Printed materials helped students' progress from frustration to instructional reading levels, while digital interventions enabled some learners to achieve independent reading proficiency. Students generally attained satisfactory to very satisfactory academic performance in English and recognized the benefits of both reading formats. Printed materials supported concentration and comprehension, whereas digital resources offered accessibility and interactive learning opportunities, although students reported lower motivation in completing digital reading tasks. The statistically significant difference in posttest reading performance favored digital interventions. However, neither printed nor digital literacy interventions significantly predicted academic performance, indicating that achievement is influenced by multiple factors beyond reading modality.

Schools should adopt a balanced literacy approach integrating printed and digital materials to strengthen reading comprehension, fluency, and independent reading skills. Printed resources should continue supporting foundational literacy development, while digital platforms should be incorporated to enhance engagement and learning opportunities. Teachers should implement differentiated instruction and targeted interventions for students requiring additional academic support. Professional development programs should strengthen teachers' competencies in digital instruction, inclusive teaching strategies, and engaging lesson design. Interactive features, gamified learning, and personalized reading activities should be utilized to improve students' motivation in digital reading. Continuous monitoring and assessment should guide instructional improvements. Future researchers should investigate additional factors influencing academic performance, including student motivation, learning environment, teaching strategies, and parental involvement.

The study was limited to Grade 11 students enrolled in a reading intervention class at Immaculada Concepcion College, Caloocan City, during the school year 2023–2024. Its findings were restricted by the participants' demographic characteristics, the selected printed and digital reading materials, and the duration of the interventions, which limited the assessment of long-term effectiveness. Furthermore, the evaluation relied on specific literacy assessments that may not fully capture broader competencies, including critical thinking and creativity. These limitations should be considered when interpreting and generalizing the findings.

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