International Journal on Management Education & Emerging Technology
ISSN: 2583-9438

Use of Digital Tools and Their Effect on Teachers' Digital Literacy Development in Cabiao, Nueva Ecija

Mary Ann S. Hernandez[1], Jaycel R. Bagtas[2], Michael Angelo S. Contreras[3], Monica G. Dela Cruz[4], Fernando F. Estingor[5]

[123456]*Bachelor of Elementary Education, Polytechnic University of the Philippines – Cabiao Campus*

hrnndzmrynn@gmail.com, Jaycelbagtasgarcia11@gmail.com, michaelangelo397@gmail.com, nicadela16@gmail.com, Fernanestingor@gmail.com

Abstract

The present study investigated the correlation between the utilisation of digital tools and the development of digital literacy among teachers in public elementary schools of Cabiao, Nueva Ecija. The descriptive quantitative method was employed, with ninety-six (96) teachers selected through quota sample. Results were collected using a validated questionnaire along with analyzed weighted mean and Pearson's correlation. The results revealed that teachers mostly used digital tools such as Microsoft Word, Excel, PowerPoint, and Google Classroom, and strongly agreed that these tools enhanced their digital competence. The study concluded that regular use of digital tools positively affects teachers' digital literacy. Teachers were encouraged to constantly use digital tools, keep learning, and collaborate to monitor their digital skills. It was recommended to future researchers to study the long-term effects of consistent use of digital tools on teachers' digital literacy.

Article Info

Keywords: Polytechnic University of the Philippines – Cabiao Campus, Bachelor of Elementary Education, The Teachers' Digital Literacy Development, Use of Digital Tools, Classroom, Computer Laboratory

Date of Submission: 14/08/2025
Date of Review: 20/11/2025
Date of Acceptance: 06/12/2025
IJMEET / Volume 3, Issue 4, 2025
ISSN: 2583-9438

INTRODUCTION

Making use of digital tools significantly impacted the growth of teachers' digital literacy, which was essential in the classroom. Digital literacy, characterized by the capacity of effectively utilise, analyse, effectively integrate digital tools, became increasingly important as technology transformed instructional techniques. A study by Francis Academic Press (2023), identified challenges such as insufficient access to digital tools, reliance on traditional teaching methods, and resistance to implementing blended learning practices. It pointed out that while younger teachers frequently embraced new technologies, experienced educators struggled due to a lack of personalized support. Despite the increased emphasis on digital literacy in educational systems, there was little research into the complex ways that the use of digital tools influenced teachers' digital competencies. Most previous research focused on student results, leaving educators' specific challenges unexplored. This gap underlined the need for research that analysed how institutional elements, including administrative support and professional development, that influence teachers' readiness in using digital tools effectively. A 2024 OECD report indicates that professional development for teachers' digital competency is inadequate, with numerous educators lacking crucial assistance for ongoing learning and adaption to evolving technological needs. In this context, digital literacy extended beyond basic technological skills; it included the use of digital resources into teaching methods, the critical assessment of digital content, and the ability for continuous professional advancement. Considering increased investments in technology, research directly examining the impact of digital tool utilization on teachers' professional development has remained inadequate.

LITERATURE REVIEW

Schools are using more and more digital materials, which has changed how instructors educate and made it even more vital for them to teach their pupils how to use technology (Hammou, 2021; Department of Education [DepEd], 2023). ICT materials in the classroom, digital literacy's impact on teaching efficiency, and teachers' challenges in adapting to new technologies were examined in this literature review (Hammou, 2021). Many programs and initiatives aim to improve educators' technology skills (DepEd, 2023; Smith & Lee, 2019). This study showed that teachers need ongoing professional development and schools need technology integration capabilities (Jones et al., 2020). ICT has changed classroom interactions, teaching methods, and educators' digital skills (Hammou, 2021). Research shows that laptops, projectors, and personal computers are used more in modern classrooms when they are easily accessible (Hammou, 2021). Lack of resources and training made technology integration difficult in schools (Jones et al., 2020The Philippines' Department of Education (DepEd) launched the DepEd Computerisation Program in 2023 to help teachers learn digitally with multimedia packages and e-classroom configurations. A literature review examined how digital technologies improve teachers' digital literacy and simplify ICT integration into pedagogy. Smith & Lee (2019) say digital literacy improves teaching. It also stressed digital skills training and instructor support (Jones et al., 2020). Hammou (2021) and Smith & Lee (2019) examined how improving teachers' digital literacy may improve educational outcomes.

METHODOLOGY

This presentation method effectively shows the empirical study design, data collection methods, and statistical methods used to assess digital technologies' impact on Cabiao, Nueva Ecija public elementary school teachers' digital literacy development. The approach's main phases:

1. Objective Definition

The primary objective of this study was to assess the impact of digital tools on the digital literacy development of all educators from public elementary schools in chosen public primary schools in Cabiao, Nueva Ecija. The study analyzed how institutional elements, including administrative support and continuing education,

influence teachers' preparedness to utilise digital tools efficiently. Measurable success was defined through statistical testing of correlations within the utilisation of digital tools and the advancement of teachers' digital literacy, interpretation of weighted mean scores, and validation, who confirmed the practical relevance of the use of online tools on the development of teachers' digital competence.

2. Scenario Development

The research was conducted in four public elementary schools, namely San Vicente Elementary School, Concepcion Elementary School, Sta. Rita Elementary School, and San Roque Elementary School which were selected to reflect diverse teachers within Cabiao, Nueva Ecija. These schools were selected to evaluate professional learning programs that foster an inclusive technology ecosystem, which is essential for raising teachers' digital literacy. The study focused on all public elementary school teachers and aimed to address their digital literacy development, as an essential competency in today's educational system where digital technologies were integral to teaching and learning. The teachers in Cabiao, Nueva Ecija observed that while they could navigate basic functions of certain digital tools, their proficiency in integrating these tools for more complex tasks varied widely. The scenarios examined in the study reflected real-life challenges such as adjusting lesson plans to suit varying levels of digital literacy, troubleshooting technical issues during class, and maintaining equal use to digital resources for all students.

3. Setup and Configuration

A total of ninety-six (96) public elementary school teachers were selected using quota sampling technique that ensured particular subgroups were fairly represented in the sample. Results had been collected utilising a researcher-developed instrument validated by experts in educational research. The tool has three sections: a demographic information, use of digital tools, and teachers' digital literacy development. The five-point Likert scale (5-Strongly Agree, 4-Agree, 3-Somewhat Agree, 2-Disagree, and 1-Strongly Disagree) measured responses, and reliability testing using JAMOVI software yielded a Cronbach's alpha of 0.743 in terms of the use of digital tools and Cronbach's alpha of 0.828 for teachers' digital literacy development, both indicating strong internal consistency. Permissions to conduct the study were granted by Dr. Ronaldo A. Pozon, Division Superintendent of Nueva Ecija, Dr. Noemi C. Sagcal, District Supervisor, and all participating school principals. The ethical approval was obtained from the school's University Research Ethics Committee.

4. Step-by-Step Execution

The study followed a structured sequence to ensure clarity and validity. First, the researchers obtained the necessary approvals and scheduled data collection dates in coordination with the school administration. Next, the questionnaires were personally distributed to the selected teachers during regular class hours, with permissions and instructions clearly explained. The survey distribution lasted for one week until the entire target population had been surveyed. After being completed, questionnaires were promptly collected in order to avoid losing or modification to data. The results were subsequently encoded and processed for statistical analysis, concentrating on the association between the utilization of digital resources and the advancement of instructors' digital literacy.

5. Data Collection

Finalized surveys provided initial results, while school profiles provided context. The researchers calculated Pearson's r correlation coefficients and p-values from questionnaire weighted mean scores to assess statistical significance. Data collection followed ethical guidelines, ensuring precision, thoroughness, and confidentiality.

6. Evaluation and Iteration

Study results show a strong positive correlation ($r = 0.693$, $p < .001$) between digital tool use and teacher digital literacy development, confirming its statistical significance. As educators used more digital tools, their digital literacy improved. After analyzing the data and literature, instructional recommendations were adjusted for different resource levels.

7. Conclusion and Next Steps

The study concluded by discussing the benefits of using digital resources in teaching and its impact on teacher professional development. The use of digital tools was rated “Agree” and their impact on technology proficiency was rated “Strongly Agree.” Digital literacy among educators increased significantly and positively with the use of digital resources, according to statistical research. These findings show that digital resources can boost instructional efficiency, professional development, and the skills teachers need for modern education. The findings emphasize the need for strategic execution that considers diverse resource availability, technology frameworks, and educator competencies. Continuous digital pedagogy professional development, fair technological access across educational institutions, and collaborative practises that allow educators to share best practices for digital tool integration are essential recommendations. To improve support frameworks, resource accessibility, and digital literacy development among Cabiao, Nueva Ecija educators, local government and educational institutions should collaborate.

RESULTS & DISCUSSION

Cabiao, Nueva Ecija educators had a "Agree" level of general agreement about using digital tools (WM = 4.08) and a "Strongly Agree" level of consensus about how these resources affected their digital literacy development (WM = 4.48). Statistical analysis demonstrated a substantial correlation between the utilisation of digital tools and the development of teachers' digital literacy ($p < 0.001$), suggesting that increased usage of digital resources is closely linked to higher levels of digital competence. The findings agree with the conclusions of Tantiado, R. C., & Mayantao, R. (2024), indicating that educators perceived the utilisation of digital tools for managing administrative duties such as grading and attendance to be easy, hence enhancing classroom productivity. Multimedia lesson development was harder due to time and effort. The study supports Önal, N., & Özdemir, S. (2023) findings that self-directed learning and ongoing professional development improve digital literacy among educators, leading to increased confidence and proficiency in integrating digital tools. This was supported by educator comments throughout the study, which showed that while most teachers are proficient in basic digital operations, many needed more training to integrate technology into their lessons and accommodate diverse resource availability. The study emphasizes the need for continuous professional development, equitable access to technological resources, and peer collaboration to ensure scalable and sustainable digital literacy gains in Cabiao, Nueva Ecija public elementary schools.

CONCLUSION

This study found a strong correlation between digital resource use and teachers' digital literacy, suggesting that it helps overcome technology integration challenges. We showed that deliberate use of digital technology can improve instructional delivery, 21st-century teaching skills, and professional competence, supported by robust positive correlations and high respondent consensus. We expect to see how these tactics might be adapted to meet the specific needs of educators in Cabiao, Nueva Ecija, and are confident that these results will facilitate substantial improvements in professional development programs.

RECOMMENDATIONS

Educators need to regularly employ digital resources such as Google Classroom, Microsoft Word, Excel, and PowerPoint for effective course planning and execution. They needed to seek out new content, periodically revise methodologies, and assess their digital competencies. Collaboration and consistent evaluation of classroom effectiveness are crucial. Future researchers have to examine the enduring impacts of sustained digital tool utilisation on educators' digital proficiency and analyse the motivations behind the frequent adoption of these technologies.

REFERENCES

[1] Francis Academic Press (2023). Development of Digital Literacy for Teachers

[2] Hammou, A. (2021). Digital literacy and technology integration in modern classrooms. Journal of Educational Technology, 18(2), 112–125.

[3] Jones, P., Brown, L., & Garcia, R. (2020). Challenges and opportunities in technology integration for teachers. International Review of Education, 66(1), 89–104.

[4] Önal, N., & Özdemir, S. (2023). The role of self-directed learning and professional development in enhancing teachers' digital literacy. International Journal of Digital Education, 14(3), 101–120.

[5] Organisation for Economic Co-operation and Development. (2024). Education at a glance 2024: OECD indicators. OECD Publishing. https://doi.org/10.1787/c00cad36-en

[6] Smith, J., & Lee, M. (2019). Enhancing teachers' digital literacy for better educational outcomes. Teaching and Teacher Education, 34(4), 211–225.

[7] Tantiado, R. C., & Mayantao, R. (2024). Utilization of digital tools in classroom management and its impact on teacher productivity. Journal of Educational Technology Studies, 29(1), 55–72.

ACKNOWLEDGMENTS

The researchers honored ALMIGHTY GOD for His grace, for the understanding and wisdom granted for carrying out this research study. They were grateful that their school, the Polytechnic University of the Philippines, Cabiao Campus, permitted and supported them to conduct this study. The researchers extend their special acknowledgement to their thesis adviser, Asst. Prof. Criselda P. Coronado, who guided, assisted, and educated them throughout the thesis, enabling them to complete this study. The researchers also expressed their heartfelt thanks to the validators who reviewed and validated their questionnaires. They also expressed their sincere gratitude to all of the respondents who took the time to complete their questionnaire. To their classmates who genuinely assisted and mentored one another throughout their study process and provided positive support to each other throughout the ongoing process of this study. Finally, they thanked their families for their understanding and financial support. The researchers truly valued the love and guidance, which inspired them to work toward their goals.