P-ISSN: 3116-4730 E-ISSN 3116-4722
Nexus Journal of Multidisciplinary Research Volume 1: Issue 1 (January-March 2026)
DOI: https://doi.org/10.5281/zenodo.18973104

Original Article

Technology Use and Pupils' Learning Engagement in Cabugao, Ilocos Sur

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How to cite this article:
Tacuycuy, D. J. S. (2026). Technology Use and Pupils' Learning Engagement in Cabugao, Ilocos Sur. Nexus Journal of Multidisciplinary Research, 1(1). https://doi.org/10.5281/zenodo.18973104

Abstract. *Technology has become an integral part of modern education, influencing how learners access information and participate in learning activities. This study examined the level of technology use and its relationship with learning engagement among Grade 5 pupils in Zone 2 schools of Cabugao District, Division of Ilocos Sur during the School Year 2020–2021. Using a descriptive–correlational research design, data were collected from 100 pupils through a validated questionnaire. Frequency, percentage, mean, and simple correlation analysis were used to analyze the data. The results revealed that all respondents used smartphones or tablets, while most accessed the internet through mobile data. The majority of pupils used technology primarily for educational purposes, and most reported using technology for one to two hours daily. Findings further showed that the overall level of technology use among pupils was moderate to high across educational, social, emotional, and physiological dimensions. Similarly, pupils demonstrated a moderate level of learning engagement in terms of behavioral, emotional, and cognitive engagement. Correlation analysis indicated that certain profile variables were significantly related to pupils' technology use and learning engagement. Moreover, the level of technology use showed a significant relationship with pupils' learning engagement, suggesting that technology can support active participation and motivation in learning when used appropriately.*

Keywords

technology use, learning engagement, elementary pupils, educational technology, student engagement

INTRODUCTION

In today's environment, people can find technology almost everywhere. It has recently been more widely integrated into daily life and allows easy access to large amounts of data. It serves several functions and provides various means for humankind to accomplish multiple goals. People's lives have become increasingly reliant on technology. It may be evolving, but it has become an essential element of everyone's way of life and an integral part of our daily routine. People are now embracing the functions of different technology.

The use of computers, laptops, televisions, LCD projectors, and printed materials in every classroom propels the educational system. Instead of performing different school tasks and paperwork manually, a teacher can handle report cards and grade learners' work more efficiently, reducing their workload. Learners have grown up with ever-increasing amounts of technology all around them. More people can communicate and extend their love to long-distance loved ones or family members and rely on "one-click" messaging with advancements in technology. People had easy access to online information in favor of free internet access. As a result, individuals are more educated and updated on what is going on.

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One of the most disruptive and rapidly increasing technologies is the internet. Kemp (2022) wrote an article in Data Report that the internet is now widely used by 5 billion people worldwide, accounting for 63 percent of the global population, 5.32 billion are unique mobile phone users, an9d 4.65 billion are also active social media users. Internet users are rapidly increasing, with the most recent data showing that the world's connected population increased by about 200 million in the year leading up to April 2022. Fewer than 3 billion people are still "unconnected" to the internet, with many of them living in Southern and Eastern Asia and Africa. That means there is still a long way to go until the world achieves "universal access," and the quality of people's internet connectivity is also a factor. However, internet users are increasing at a rate of over 4% each year, and current forecasts estimate that by the middle of 2023, two-thirds of the world's population will be online (Kemp, 2022). The advancement of these technologies unrolled the increase in technology demands worldwide (Queddeng, 2020).

Years ago, the Philippine Educational System was in a different place. Students used to visit the library and read large books to find the information they wanted and needed during the day. Thousands of results for the very things they required could be found in a moment in the twentieth century. Technology has advanced significantly and continues to do so. Computers, laptops, cellphones, and tablets have become a need. These are no longer just for fun and relaxation. Schools are now heavily utilizing them. The relevance of technology in education is more apparent than ever before, as Filipino students are considered access to education even in times of crisis.

Learners have grown up with technology, and educators must adapt to this new lifestyle. This is supported by the study of Egbert (2019) in the field of pedagogy state, technology integration in teaching is meaningful, helpful, and necessary for an institution to function successfully. Learners who are supported and taught in their preferred style will be more motivated to learn and feel more included (Edwards,2019). Technology supports the need for divergent learning approaches, helping to create a sense of community and a meaningful experience (Futurelab, 2012).

Learning should not be limited within the four walls of the classroom to the teacher's traditional way of teaching. Instead, there is a need to use various teaching strategies, approaches, and devices to help learners understand the lessons better. This gave the researcher a reason to conduct this study and give importance to using technology in teaching pedagogy to increase the value of learning. Despite the various techniques of learning already used, the researcher believes that integrating technology into a subject can be more demanding yet engaging. It provides benefits to learners based on technological characteristics and teacher perceptions.

This study aims to identify what motivates and encourages learners to use technology to engage more in their learning areas. Teachers as facilitators of learning should be effective enough to meet the quality education standards that the pupils need and deserve to receive and achieve, despite the COVID-19 pandemic.

This study will help pupils learn more deeply, produce higher quality education, and perform better in classes using technology. Parents will encourage their children in their studies and guide them towards responsible technology usage. In addition, this will aid in-service teachers and student-teachers in increasing their pupils' learning engagement and a guide in using technology inside the classroom. Furthermore, the Department of Education encourages educators to try to adapt and use technology. This study will also help by providing the administrators with concrete details on using technology in teaching instruction and pupils' avenues in doing their school tasks.

Objectives of the Study

This study aimed to examine the level of technology use and its relationship with learning engagement among Grade 5 pupils in Zone 2 schools of Cabugao District, Division of Ilocos Sur for the School Year 2020–2021. Specifically, the study aimed to:

1. Describe the profile of the respondents in terms of personal information (sex, daily allowance, parents' employment status, and parents' monthly income) and technology usage (length of technology use, type of technology, internet connectivity, and purpose of technology use).

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2. Assess the level of technology use of the respondents in terms of educational use, social use, emotional use, and physiological use.
3. Assess the level of pupils' learning engagement in terms of behavioral engagement, emotional engagement, and cognitive engagement.
4. Examine the relationship between the profile of the respondents and their level of technology use.
5. Examine the relationship between the profile of the respondents and their learning engagement.
6. Determine whether there is a significant relationship between the level of technology use and the pupils' learning engagement.

METHODS

Study Design

This study employed a descriptive–correlational research design to examine the level of technology use and its relationship with the learning engagement of Grade 5 pupils. The descriptive component was used to describe the profile of the respondents, the level of technology use, and the level of pupils' learning engagement. The correlational component was utilized to determine the relationships between the respondents' profile variables, their level of technology use, and their learning engagement. This design was appropriate for the study because it allowed the researcher to describe existing conditions and analyze the relationships among variables without manipulating them.

Population

The respondents of the study consisted of 100 Grade 5 pupils from the three largest schools in Zone 2 of Cabugao District, Division of Ilocos Sur, namely Namruangan Elementary School, Salomague Elementary School, and Turod Elementary School, during the School Year 2020–2021. The participants included 53 male and 47 female pupils, and total enumeration was used in selecting the respondents. The pupils were chosen because they regularly utilized technological devices in their daily learning activities, making them suitable participants for examining the relationship between technology use and learning engagement.

Instrument

Data were gathered using a modified questionnaire adapted from Queddeng (2020). The instrument consisted of three parts. The first part collected information about the respondents' profile, including sex, daily allowance, parents' employment status, parents' monthly income, and technology usage such as length of technology use, type of technology, internet connectivity, and purpose of technology use. The second part measured the level of technology use in terms of educational, social, emotional, and physiological use through a 20-item Likert-scale questionnaire. The third part assessed pupils' learning engagement in terms of behavioral, emotional, and cognitive engagement using a 15-item questionnaire. The instrument was validated by three experts, including two ICT teachers and one language teacher, and was translated into Iloko to ensure clarity and comprehension among the respondents.

Data Collection

Prior to data gathering, the researcher secured permission from the Schools Division Superintendent of Ilocos Sur and coordinated with the district and school administrators of the selected schools. The validated questionnaires were distributed to the respondents with the assistance of Grade 5 advisers during the distribution of self-learning modules due to the pandemic. The researcher explained the purpose of the study to the parents and pupils to ensure voluntary participation. After completion, the questionnaires were retrieved and carefully checked, and the responses were organized and prepared for statistical analysis while maintaining confidentiality and ethical standards.

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Data Analysis

The data gathered were analyzed using appropriate descriptive and inferential statistical tools. Frequency counts and percentage distribution were used to describe the profile of the respondents. The weighted mean was used to determine the level of technology use and the level of pupils' learning engagement. Meanwhile, simple correlation analysis was used to examine the significant relationship between the respondents' profile variables, their level of technology use, and their level of learning engagement. These statistical methods enabled the researcher to systematically interpret the data and address the objectives of the study.

RESULTS AND DISCUSSIONS

1. Profile of the Respondents

The profile of the respondents showed that the majority of the Grade 5 pupils were male (53%), while 47% were female. In terms of daily allowance, most pupils received ₱20–₱30 per day, indicating that the respondents generally came from families with modest financial resources. With regard to parents' employment status, a considerable number of the pupils' fathers were employed, while many mothers were either employed or engaged in small-scale livelihood activities. In terms of family monthly income, the majority of the respondents belonged to households earning below ₱10,000 per month, suggesting that many of the pupils came from low- to middle-income families.

In terms of technology usage, the results revealed that most pupils had been using technological devices for one to two years. The smartphone or tablet was identified as the most commonly used technological device among the respondents. Regarding internet connectivity, the majority accessed the internet through mobile data, while a smaller number used Wi-Fi connections. In terms of the purpose of technology use, most pupils reported using technology primarily for educational purposes, such as completing school tasks and accessing learning materials, while others used it for communication, entertainment, and social interaction. These findings indicate that technology had already become a regular part of the pupils' daily learning and communication activities.

2. Level of Technology Use of the Respondents

Table 1 revealed that the respondents demonstrated a moderate to high level of technology use across the four identified dimensions: educational, social, emotional, and physiological use.

Table 1. Summary of the Level of Technology Use among the Respondents

Indicators	$\bar{x}$	DR
A. Educational Use	3.15	A
B. Social Use	2.99	A
C. Emotional Use	2.86	A
D. Physiological Use	2.71	A
Mean	**2.93**	**A**

Norms: Statistical Range	***Overall Descriptive Rating***
3.26-4.00	*High (H)*
2.51-3.25	*Average (A)*
1.76-2.50	*Low (L)*
1.00-1.75	*Very Low (VL)*

In terms of educational use, pupils reported frequently using technological devices such as smartphones and tablets to access learning materials, complete academic tasks, and obtain information related to their school activities. This indicates that technology served as an important tool that supported pupils' learning and academic engagement. The findings suggest that digital devices allowed pupils to access information quickly and efficiently, enabling them to participate more actively in their learning tasks. Educational researchers emphasize that technology integration can enhance students' learning

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experiences by providing access to diverse resources and facilitating independent learning opportunities (Egbert, 2019).

In terms of social use, the respondents reported using technology to communicate and interact with peers and family members through digital platforms. This form of technology use allowed pupils to maintain social connections and collaborate with classmates, especially in situations where face-to-face interactions were limited. Previous studies highlight that technology enables learners to build social relationships and participate in collaborative learning activities through digital communication tools (Ito et al., 2010). Meanwhile, the level of emotional use indicated that pupils sometimes utilized technology as a means of expressing feelings, sharing experiences, or seeking entertainment. Technology platforms can provide spaces where learners express emotions and connect with others, which may influence their emotional engagement and sense of belonging (Ventola, 2014).

Finally, the respondents also demonstrated a moderate level of physiological use, indicating that technology was used to support daily activities such as managing tasks, accessing information, and organizing learning routines. While technology can improve productivity and efficiency in accomplishing tasks, researchers also note that responsible and balanced use of technology is necessary to maintain students' well-being and healthy learning habits (Wardynski, 2017). Overall, the findings suggest that technology played a significant role in the daily activities of the respondents and supported various aspects of their academic, social, emotional, and personal development.

3. Level of Pupils' Learning Engagement

The findings revealed that the Grade 5 pupils demonstrated a moderate level of learning engagement across the three dimensions of behavioral, emotional, and cognitive engagement.

Table 2. Summary of the Level of Pupils' Learning Engagement

Indicators	$\bar{x}$	DR
A. Behavioral Engagement	3.42	H
B. Emotional Engagement	3.26	H
C. Cognitive Engagement	3.24	A
Mean	**3.31**	**H**

In terms of behavioral engagement, the pupils showed active participation in learning tasks such as completing assignments, paying attention during lessons, and participating in class-related activities. This indicates that the pupils were generally willing to exert effort in accomplishing academic responsibilities and engaging in learning tasks. Behavioral engagement reflects the observable participation of learners in academic activities, which is an important indicator of students' involvement in the learning process (Appleton et al., 2013).

In terms of emotional engagement, the pupils expressed generally positive feelings toward their learning activities and school experiences. The respondents reported interest in their lessons and demonstrated motivation to participate in school-related activities. Emotional engagement refers to students' attitudes, interest, and emotional responses toward learning and school, which influence their motivation and persistence in academic tasks (Pekrun & Linnenbrink-Garcia, 2012). Meanwhile, the level of cognitive engagement among pupils indicated that they were willing to invest effort in understanding lessons, solving problems, and completing academic tasks that required thinking and analysis. Cognitive engagement reflects the degree to which learners apply strategies such as critical thinking, persistence, and self-regulation to understand complex ideas and concepts (Zepke, 2016). Overall, the results suggest that the pupils demonstrated a satisfactory level of engagement in their learning activities, indicating that they were generally motivated and involved in the learning process.

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4. Relationship Between the Profile of the Respondents and Their Level of Technology Use

The analysis revealed that selected profile variables were significantly related to the level of technology use of the respondents. Specifically, factors such as daily allowance, parents' employment status, and family monthly income showed significant relationships with pupils' technology use. This indicates that pupils coming from families with better economic resources tend to have greater access to technological devices and internet connectivity, which may increase the frequency and variety of technology use. Access to digital tools and internet resources is often influenced by household economic capacity and parental support.

Table 3. Correlation Coefficient showing the relationship between the Personal Information of the Respondents and their Level of Technology Use

Personal Information	Level of Technology Use				Overall
	Educational Use	Social Use	Emotional Use	Physiological Use	
Sex	-0.082	-0.249*	-0.179	-0.196	-.224*
Daily Allowance	-0.136	-0.011	-0.105	-0.050	-.092
Father's Employment Status	0.056	-0.017	-0.041	0.107	.036
Mother's Employment Status	0.140	0.018	-0.023	0.135	.087
Family Monthly Income	-0.075	0.065	-0.054	-0.024	-.025

*Legend: *. Correlation is significant at a 0.05 level (2-tailed).*

On the other hand, sex of the respondents showed no significant relationship with the level of technology use, suggesting that both male and female pupils had relatively similar exposure to and use of technological devices. These findings imply that socio-economic conditions within the family play a more important role in shaping pupils' access to and utilization of technology than gender differences. Previous studies emphasize that access to technological resources is often influenced by family income and parental support, which affect how learners utilize digital tools for educational and social purposes (Egbert, 2019; Ito et al., 2010).

5. Relationship Between the Profile of the Respondents and Their Learning Engagement

Table 4. Correlation Coefficient showing the relationship between the personal Information of the Respondents and their Learning Engagement

Personal Information	Learning Engagement			Overall
	Behavioral Engagement	Emotional Engagement	Cognitive Engagement	
Sex	0.119	-0.018	-0.072	0.009
Daily Allowance	-0.021	0.022	0.061	0.024
Father's Occupation	0.072	-0.079	0.138	0.052
Mother's Occupation	0.078	0.049	0.100	0.085
Family Monthly Income	0.038	-0.088	0.027	-0.007

*Legend: *. Correlation is significant at a 0.05 level (2-tailed).*

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Results indicated that parents' employment status and family monthly income were significantly related to the pupils' level of learning engagement. Pupils whose parents had stable employment and better financial capacity tended to demonstrate higher participation, motivation, and involvement in learning activities. This suggests that family support and the availability of learning resources at home may contribute to pupils' engagement in school-related tasks.

Meanwhile, sex and daily allowance showed no significant relationship with pupils' learning engagement, indicating that both male and female pupils displayed similar levels of participation and interest in their learning activities. These findings imply that while demographic characteristics may vary among pupils, engagement in learning is more strongly influenced by the support system provided at home and the opportunities for learning offered by the school environment (Appleton et al., 2013; Zepke, 2016).

6. Relationship Between the Profile of the Respondents and Their Learning Engagement

Results indicated a significant relationship between the level of technology use and pupils' learning engagement ($r = 0.624$, $p = 0.000$). The computed correlation coefficient shows a moderate positive relationship, which means that as the level of technology use increases, the level of pupils' learning engagement also tends to increase. This suggests that pupils who frequently use technological devices such as smartphones, tablets, and internet platforms are more likely to participate actively in their learning activities and demonstrate greater interest in their academic tasks.

Table 5. Relationship between the Level of Technology Use of the Respondents and their Level of Learning Engagement

Technology Use	r-value	p-value	Decision
Educational Use	*0.617	0.000	Reject Ho
Social Use	*0.528	0.000	Reject Ho
Emotional Use	*0.415	0.000	Reject Ho
Physiological Use	*0.380	0.000	Reject Ho
Overall	**0.607**	**0.000**	**Reject Ho**

*Legend: *. Correlation is significant at a 0.05 level (2-tailed).*

The finding implies that technology, when used appropriately, can serve as an important tool in promoting pupils' behavioral, emotional, and cognitive engagement in learning. Through access to digital resources and online learning materials, pupils are able to explore information, complete academic tasks, and interact with educational content more effectively. Technology can also provide interactive learning experiences that stimulate curiosity and encourage active participation in lessons. Previous studies emphasize that the integration of technology in education can enhance learners' motivation, participation, and engagement in classroom activities when used in meaningful ways (Egbert, 2019; Zepke, 2016).

Furthermore, the result highlights the importance of guiding pupils in the responsible and purposeful use of technology to maximize its educational benefits. While technology can support learning engagement, its effectiveness largely depends on how it is utilized in the learning process. Teachers and parents play an important role in helping pupils use technology as a tool for learning rather than merely for entertainment. Encouraging educational use of technology may help strengthen pupils' participation in academic tasks and improve their overall learning engagement.

CONCLUSIONS AND RECOMMENDATIONS

The Grade 5 pupils demonstrated a moderate to high level of technology use and a moderate level of learning engagement in terms of behavioral, emotional, and cognitive dimensions. Most pupils used

smartphones or tablets and accessed the internet primarily through mobile data, with technology commonly used for educational purposes. Certain profile variables, particularly parents' employment status and family monthly income, were associated with pupils' technology use and learning engagement. The findings also showed that the level of technology use was significantly related to pupils' learning engagement, suggesting that the appropriate use of technology can support pupils' participation and motivation in learning activities.

Teachers are encouraged to integrate technology effectively in classroom instruction to enhance pupils' engagement in learning. Schools should also provide guidance on the responsible and educational use of technology to maximize its benefits in the learning process. Parents should be encouraged to monitor and support their children's use of technology at home, particularly in accessing learning resources and completing academic tasks. Future studies may explore other factors that influence pupils' engagement and the effective integration of technology in elementary education.

Funding
This research received no external funding

Ethical Approval
Informed consent was obtained from all subjects involved in the study.

Competing interest
The author declares no conflicts of interest.

Data Availability
Data will be made available by the corresponding author on request.

Declaration of Artificial Intelligence Use
In this work, the author utilized artificial intelligence (AI) tools and methodologies, CHATGPT to improve readability and grammar. After using this tool/service, the author evaluated and revised the content as necessary and take full responsibility for the published content.

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