

Demographic Profile and Perceived Effectiveness of Modern Technology among Grade 6 Pupils: A Correlational Study

Ronnie L. Cruz^{1*}, Celso C. Dumalig²

Northeastern College, Inc. Graduate School, Santiago City, Philippines

Corresponding Author: Celso C. Dumalig celso.dumalig@deped.gov.ph

ARTICLE INFO

Keywords: Modern technology, perceived effectiveness, demographic profile, elementary education

Received : 09, June

Revised : 12, July

Accepted: 31, August

©2026 Cruz, Dumalig : This is an open-access article distributed under the terms of the [Creative Commons Atribusi 4.0 Internasional](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

This study examined the relationship between demographic profile and perceived effectiveness of modern technology among 50 randomly selected Grade 6 pupils at Kasiglahan Village Elementary School during School Year 2026-2027 using a descriptive-correlational research design. Data were gathered through a researcher-made questionnaire measuring pupils' perceptions of technology effectiveness across 20 indicators. Findings revealed that pupils perceived modern technology as highly effective (overall mean=4.28), particularly in motivating task completion, building academic confidence, and ease of use. Chi-square tests revealed significant relationships between pupils' perceptions and their sex, age, section, frequency of technology use, and type of device used ($p<0.05$). Smartphones were the most commonly used device (84%). The study concludes that demographic factors significantly influence how pupils perceive technology effectiveness, recommending targeted interventions for equitable technology integration.

INTRODUCTION

In the 21st century, modern technology has become an integral part of educational systems worldwide, transforming traditional classrooms into dynamic and interactive learning environments. Digital tools such as educational apps, online platforms, tablets, and multimedia resources offer opportunities for enhanced student engagement, personalized learning, and improved academic outcomes (Casilao, Satojito, & Martir, 2025). In the Philippine context, technology integration in schools has accelerated in response to the educational disruptions caused by the COVID-19 pandemic, with educators and policymakers emphasizing the importance of digital tools to support continuity of learning and develop essential digital skills among learners (Department of Education). However, challenges such as limited infrastructure, unequal access to devices, and variations in teacher readiness continue to influence the effectiveness of technology use in many public schools (Philippines: Digital Tools Empower Students and Teachers, 2026).

Kasiglahan Village Elementary School (KVES), a prominent public elementary institution located in Barangay San Jose, Montalban, Rizal, serves one of the largest learner populations in the Division of Rizal, offering inclusive basic education to diverse learners from Grades 1 to 6. The school has a history of academic resilience and community support, striving to implement innovative strategies to enhance learning despite resource constraints and the lingering effects of remote and blended instructional modes following the pandemic years (School Learning Recovery Plan, SY 2022–2023). During the pandemic, KVES implemented learning recovery plans to bridge learning gaps, emphasizing the use of educational technology to maintain continuity and support pupil learning. However, the degree to which modern technology influences actual learning outcomes, engagement, and perceptions among Grade 6 pupils in face-to-face or blended settings remains underexplored.

Understanding how Grade 6 pupils of Kasiglahan Village Elementary School perceive and experience modern technology in their learning is crucial for improving instructional practices and informing future resource allocation. Furthermore, exploring the relationship between pupils' demographic profiles – such as age, sex, frequency of technology use, and type of device used – and their perceptions of technology's effectiveness can deliver insights into potential disparities and areas for targeted support. Therefore, this study investigates the effectiveness of modern technology on Grade 6 pupils, focusing on pupils' perceptions and how demographic factors may shape these experiences.

LITERATURE REVIEW

Foreign and local studies consistently demonstrate that technology integration enhances students' academic performance, engagement, motivation, and higher-order thinking skills. International research reported that educational applications, multimedia tools, virtual laboratories, simulations, and interactive platforms significantly improve comprehension, retention, literacy, numeracy, scientific understanding, critical thinking, self-directed learning, collaboration, and digital literacy (Zhao Ma et al., 2024; Hori & Fujii, 2021; Jannah, 2024; Turan & Atila, 2025; Aloovi, 2025; Ishtiaq et al., 2025; Ahmad Bhat, 2025; Agatep &

Maquio, 2022; Sanabil Jawed et al., 2025; Ruijia et al., 2025). Similarly, Philippine studies found that technology-supported instruction improves reading comprehension, vocabulary, learner motivation, participation, independent learning, and overall academic performance, confirming its effectiveness in promoting learner-centered education (Ligpitan et al., 2025; Baylen & Junsay, 2023; Mission et al., 2021; Adolfo et al., 2019–2020).

The literature consistently emphasizes that successful technology integration depends on teacher competence, adequate resources, and institutional support. International studies identified teacher proficiency, instructional design, differentiated instruction, and timely feedback as essential factors for maximizing technology's educational benefits (Zhao Ma et al., 2024; Turan & Atila, 2025; Hori & Fujii, 2021; Jannah, 2024; Aloovi, 2025; Ishtiaq et al., 2025; Ahmad Bhat, 2025; Agatep & Maquio, 2022; Sanabil Jawed et al., 2025; Ruijia et al., 2025). Likewise, Philippine research highlighted barriers such as inadequate ICT skills, limited digital resources, insufficient infrastructure, and unequal access to devices, while stressing the importance of professional development, administrative support, and strategic implementation for effective technology-enhanced instruction (Paran et al., 2024; Baylen & Junsay, 2023; Mission et al., 2021; Adolfo et al., 2019–2020).

Both foreign and local literature consistently establish that technology integration positively influences students' academic achievement, engagement, motivation, collaboration, and 21st-century skills when implemented effectively. Across the studies, educational technologies support personalized and interactive learning experiences, while teacher competence, sufficient resources, and structured implementation remain critical determinants of success. Collectively, these findings provide strong empirical support for integrating technology into elementary education to improve learning outcomes and instructional effectiveness (Zhao Ma et al., 2024; Hori & Fujii, 2021; Jannah, 2024; Turan & Atila, 2025; Aloovi, 2025; Ishtiaq et al., 2025; Ahmad Bhat, 2025; Agatep & Maquio, 2022; Sanabil Jawed et al., 2025; Ruijia et al., 2025; Ligpitan et al., 2025; Paran et al., 2024; Baylen & Junsay, 2023; Mission et al., 2021; Adolfo et al., 2019–2020).

METHODOLOGY

This study employed a descriptive-correlational research design to determine the effectiveness of modern technology on Grade 6 pupils and to examine its relationship with the respondents' demographic profile. The study was conducted at Kasiglahan Village Elementary School, Rodriguez, Rizal, during the Academic Year 2026–2027. Using simple random sampling, fifty (50) Grade 6 pupils were selected as respondents, ensuring that each learner had an equal opportunity to participate. Data were collected through a researcher-made survey questionnaire consisting of two parts: the respondents' demographic profile (age, sex, and section) and a 20-item scale measuring the effectiveness of modern technology. The instrument underwent pilot testing, and its reliability was established using Cronbach's Alpha.

Prior to data collection, permission was secured from the school administration, and informed consent, confidentiality, and ethical considerations

were observed throughout the study. Completed questionnaires were checked, edited, tallied, and prepared for analysis. The collected data were analyzed using frequency and percentage distribution to describe the respondents' profile, weighted mean and a five-point Likert scale to determine the perceived effectiveness of modern technology, and the Chi-square test to examine the significant relationship between the respondents' demographic characteristics and the effectiveness of modern technology.

RESULTS

Profile of the Respondents

This part of the research presents the general profile of the respondents.

Table 1. Distribution of Respondents as to Sex

Particulars	Frequency	Percentage
Male	18	36.00
Female	32	64.00
Total	50	100.00

Table 1 shows the gender of the respondents. It can be seen that females account for 32 or 64 percent, while the male counterpart accounts for 18 or 36 percent. Of the 50 respondents, it is implied that females outnumber males.

Table 2. Distribution of Respondents as to Age

Particulars	Frequency	Percentage
10 years old	10	20.00
11 years old	18	36.00
12 years old	22	44.00
Total	50	100.00

It can be gleaned from Table 2 that the distribution of respondents according to age. The data revealed that the majority of the respondents were 12 years old, with a frequency of 22 or 44.00 percent of the total population. This was followed by 11-year-old pupils with a frequency of 18 or 36.00 percent. Meanwhile, 10-year-old pupils had the lowest frequency of 10 or 20.00 percent. The findings indicated that most of the Grade 6 respondents belonged to the typical age range expected for their grade level.

Table 3. Distribution of Respondents as to Section

Particulars	Frequency	Percentage
Daisy	12	24.00
Rose	10	20.00
Sampaguita	11	22.00
Lily	17	34.00
Total	50	100.00

Table 3 reveals the distribution of respondents according to their section. The data showed that the majority of the respondents came from the Lily section, with a frequency of 17 or 34.00 percent of the total population. This was followed by Daisy with 12 respondents or 24.00 percent, Sampaguita with 11 respondents or 22.00 percent, and Rose with 10 respondents or 20.00 percent. The findings indicated that respondents were fairly distributed among the four sections, with Lily having the highest representation in the study.

Table 4. Distribution of Respondents as to Frequency of Technology Use for Learning

Particulars	Frequency	Percentage
Daily	24	48.00
2-3 times a week	13	26.00
Once a week	10	20.00
Rarely	3	6.00
Total	50	100.00

It can be gleaned in Table 4 the distribution of respondents according to the frequency of technology use for learning. The data revealed that the majority of the respondents used technology daily, with a frequency of 24 or 48.00 percent of the total population. This was followed by respondents who used technology 2–3 times a week, with a frequency of 13 or 26.00 percent. Meanwhile, 10 respondents or 20.00 percent used technology once a week, while only 3 respondents or 6.00 percent reported that they rarely used technology for learning purposes. The findings indicated that most of the Grade 6 pupils frequently utilized technology as part of their learning activities.

Table 5. Distribution of Respondents as to Type of Device Usually Used for Learning

Particulars	Frequency	Percentage
Desktop	5	10.00
Tablet	3	6.00
Smart Phone	42	84.00
Total	50	100.00

Table 5 revealed the distribution of respondents according to the type of device usually used for learning. The data showed that the majority of the respondents used smartphones for learning, with a frequency of 42 or 84.00 percent of the total population. This was followed by desktop users with a frequency of 5 or 10.00 percent, while tablet users had the lowest frequency of 3 or 6.00 percent. The findings shows that smartphones were the most commonly used learning device among Grade 6 pupils due to their accessibility and convenience for educational activities.

Problem Proper

Table 6. Computed Mean on The Effectiveness of Modern Technology on Grade 6 Pupils

Particulars	Weighted Mean	Qualitative Description
1. I feel more interested in learning when modern technology is used in class.	4.20	Agree
2. Using technology helps me pay more attention during lessons.	4.18	Agree
3. Technology makes classroom activities more enjoyable.	4.67	Strongly Agree
4. I am more likely to participate in class when we use technological tools.	4.25	Strongly Agree
5. I prefer lessons that incorporate technology over traditional lessons.	3.85	Agree
6. Modern technology helps me understand difficult concepts more easily.	3.50	Agree
7. Using technology improves my performance in assignments and tests.	3.79	Agree
8. Technology helps me remember what I learned for a longer time.	4.18	Agree
9. Technology enables me to learn at my own pace.	4.69	Strongly Agree
10. I feel more confident in my academic abilities when using technology.	4.87	Strongly Agree
11. Using technology motivates me to complete tasks and homework on time.	4.95	Strongly Agree
12. Technology helps me become more independent in learning.	4.28	Strongly Agree
13. Technology encourages me to explore new topics outside the classroom.	3.25	Neutral
14. I feel that technology improves my problem-solving skills.	3.79	Agree
15. Technology helps me develop my digital literacy skills.	4.55	Strongly Agree
16. I find it easy to use the technology tools provided in class.	4.82	Strongly Agree

17. The technology used in class is reliable and works properly.	4.47	Strongly Agree
18. I can access learning materials through technology anytime I need them.	4.45	Strongly Agree
19. I can easily understand the instructions when using technological tools.	4.31	Strongly Agree
20. I feel comfortable asking for help when I have difficulty using technology.	4.54	Strongly Agree
Average Weighted Mean	4.28	Strongly Agree

Table 6 shows that Grade 6 pupils perceived modern technology as highly effective, with an overall weighted mean of 4.28 (Strongly Agree). Using the weighted mean and five-point Likert scale, the study found that technology most strongly motivated pupils to complete tasks on time (4.95), increased their academic confidence (4.87), and was easy to use (4.82). Other indicators, including self-paced learning, enjoyable classroom activities, digital literacy, accessibility of learning materials, learner independence, and class participation, were also rated Strongly Agree.

The remaining indicators, such as increased interest, attention, lesson retention, academic performance, problem-solving, and understanding of difficult concepts, were rated Agree (3.50–4.20). The lowest-rated statement, "Technology encourages me to explore new topics outside the classroom," obtained a weighted mean of 3.25 (Neutral). Overall, the results indicate that modern technology effectively enhances pupils' motivation, engagement, confidence, and learning experiences, although its influence on independent learning beyond the classroom is relatively limited.

Table 7. Significant Relationship between the Effectiveness of Modern Technology on Grade 6 Pupils and their Sex

Particulars	Chi-Square	Significance
1. I feel more interested in learning when modern technology is used in class.	38.251*	0.000
2. Using technology helps me pay more attention during lessons.	42.691*	0.000
3. Technology makes classroom activities more enjoyable.	35.218*	0.000
4. I am more likely to participate in class when we use technological tools.	36.558*	0.000
5. I prefer lessons that incorporate technology over traditional lessons.	28.663*	0.000
6. Modern technology helps me understand difficult concepts more easily.	35.876*	0.000
7. Using technology improves my performance in assignments and tests.	40.741*	0.000
8. Technology helps me remember what I learned for a longer time.	33.852*	0.000
9. Technology enables me to learn at my own pace.	36.951*	0.000
10. I feel more confident in my academic abilities when using technology.	33.159*	0.000
11. Using technology motivates me to complete tasks and homework on time.	43.247*	0.000
12. Technology helps me become more independent in learning.	36.250*	0.000
13. Technology encourages me to explore new topics outside the classroom.	32.321*	0.000
14. I feel that technology improves my problem-solving skills.	26.456*	0.000
15. Technology helps me develop my digital literacy skills.	27.595*	0.000
16. I find it easy to use the technology tools provided in class.	28.456*	0.000
17. The technology used in class is reliable and works properly.	31.254*	0.000

18. I can access learning materials through technology anytime I need them.	32.957*	0.000
19. I can easily understand the instructions when using technological tools.	36.254*	0.000
20. I feel comfortable asking for help when I have difficulty using technology.	38.489*	0.000

Table 7 shows that the Chi-square test revealed a significant relationship between the respondents' sex and their perceptions of the effectiveness of modern technology. All computed Chi-square values ranged from 26.456 to 43.247, with p-values of 0.000, which are lower than the 0.05 level of significance. Therefore, the null hypothesis was rejected, indicating that pupils' perceptions of modern technology significantly differ according to sex.

The findings suggest that sex influences how Grade 6 pupils perceive the effectiveness of modern technology. This result is consistent with the studies of Alcantara and Lazo (2010), Rivamonte and Santos (2024), and Obaña and Espartero (2025), which reported that gender is significantly associated with learners' digital competency, engagement, and perceptions of technology-supported learning.

Table 8. Significant Relationship between the Effectiveness of Modern Technology on Grade 6 Pupils and their Age

Particulars	Chi-Square	Significance
1. I feel more interested in learning when modern technology is used in class.	-0.815*	0.000
2. Using technology helps me pay more attention during lessons.	-0.648*	0.000
3. Technology makes classroom activities more enjoyable.	-0.838*	0.000
4. I am more likely to participate in class when we use technological tools.	-0.957*	0.000
5. I prefer lessons that incorporate technology over traditional lessons.	-0.594*	0.000
6. Modern technology helps me understand difficult concepts more easily.	-0.677*	0.000
7. Using technology improves my performance in assignments and tests.	-0.749*	0.000
8. Technology helps me remember what I learned for a longer time.	-0.711*	0.000
9. Technology enables me to learn at my own pace.	-0.684*	0.000
10. I feel more confident in my academic abilities when using technology.	-0.948*	0.000
11. Using technology motivates me to complete tasks and homework on time.	-0.933*	0.000
12. Technology helps me become more independent in learning.	-0.749*	0.000
13. Technology encourages me to explore new topics outside the classroom.	-0.547*	0.000
14. I feel that technology improves my problem-solving skills.	-0.557*	0.000
15. Technology helps me develop my digital literacy skills.	-0.791*	0.000
16. I find it easy to use the technology tools provided in class.	-0.847*	0.000
17. The technology used in class is reliable and works properly.	-0.751*	0.000
18. I can access learning materials through technology anytime I need them.	-0.821*	0.000
19. I can easily understand the instructions when using technological tools.	-0.451*	0.000
20. I feel comfortable asking for help when I have difficulty using technology.	-0.776*	0.000

Table 8 shows that the Chi-square test revealed a significant relationship between the respondents' age and their perceptions of the effectiveness of

modern technology. All indicators obtained p-values of 0.000, which are below the 0.05 level of significance, with computed values ranging from -0.451 to -0.957. Thus, the null hypothesis was rejected, indicating that age is significantly related to pupils' perceptions of modern technology.

The findings suggest that age influences pupils' engagement and perceptions of technology-enhanced learning. This result supports the studies of Mandar (2024), Albarillo, Munar, and Balcita (2022), and Sibug et al. (2026), which concluded that age affects learners' ICT literacy, confidence, adaptability, and overall effectiveness in using digital learning tools.

Table 9. Significant Relationship between the Effectiveness of Modern Technology on Grade 6 Pupils and their Section

Particulars	Chi-Square	Significance
1. I feel more interested in learning when modern technology is used in class.	28.251*	0.000
2. Using technology helps me pay more attention during lessons.	32.657*	0.000
3. Technology makes classroom activities more enjoyable.	33.687*	0.000
4. I am more likely to participate in class when we use technological tools.	25.766*	0.000
5. I prefer lessons that incorporate technology over traditional lessons.	35.214*	0.000
6. Modern technology helps me understand difficult concepts more easily.	28.649*	0.000
7. Using technology improves my performance in assignments and tests.	34.655*	0.000
8. Technology helps me remember what I learned for a longer time.	27.955*	0.000
9. Technology enables me to learn at my own pace.	28.725*	0.000
10. I feel more confident in my academic abilities when using technology.	33.576*	0.000
11. Using technology motivates me to complete tasks and homework on time.	22.862*	0.000
12. Technology helps me become more independent in learning.	42.951	0.000
13. Technology encourages me to explore new topics outside the classroom.	28.571*	0.000
14. I feel that technology improves my problem-solving skills.	33.549*	0.000
15. Technology helps me develop my digital literacy skills.	37.688*	0.000
16. I find it easy to use the technology tools provided in class.	41.258*	0.000
17. The technology used in class is reliable and works properly.	44.594*	0.000
18. I can access learning materials through technology anytime I need them.	36.147*	0.000
19. I can easily understand the instructions when using technological tools.	32.369*	0.000
20. I feel comfortable asking for help when I have difficulty using technology.	40.684*	0.000

Table 9 shows that the Chi-square test revealed a significant relationship between the respondents' section and their perceptions of the effectiveness of modern technology. All indicators obtained p-values of 0.000, which are below the 0.05 level of significance, with Chi-square values ranging from 22.862 to 44.594. Therefore, the null hypothesis was rejected, indicating that pupils' section significantly influences their perceptions of modern technology.

The findings suggest that differences in classroom sections may affect pupils' motivation, engagement, participation, comprehension, and digital literacy. This result supports the studies of Villanueva et al. (2023), Gelacio and

Comighud (2020), and Tamban et al. (2021), which found that variations in classroom environments and ICT implementation across sections significantly influence learners' experiences and perceptions of technology-supported learning.

Table 10. Significant Relationship between the Effectiveness of Modern Technology on Grade 6 Pupils and their Frequency of Technology Use for Learning

Particulars	Chi-Square	Significance
1. I feel more interested in learning when modern technology is used in class.	-0.766*	0.000
2. Using technology helps me pay more attention during lessons.	-0.715*	0.000
3. Technology makes classroom activities more enjoyable.	-0.869*	0.000
4. I am more likely to participate in class when we use technological tools.	-0.931*	0.000
5. I prefer lessons that incorporate technology over traditional lessons.	-0.654*	0.000
6. Modern technology helps me understand difficult concepts more easily.	-0.751*	0.000
7. Using technology improves my performance in assignments and tests.	-0.954*	0.000
8. Technology helps me remember what I learned for a longer time.	-0.815*	0.000
9. Technology enables me to learn at my own pace.	-0.922*	0.000
10. I feel more confident in my academic abilities when using technology.	-0.654*	0.000
11. Using technology motivates me to complete tasks and homework on time.	-0.815*	0.000
12. Technology helps me become more independent in learning.	-0.654*	0.000
13. Technology encourages me to explore new topics outside the classroom.	-0.746*	0.000
14. I feel that technology improves my problem-solving skills.	-0.687*	0.000
15. Technology helps me develop my digital literacy skills.	-0.815*	0.000
16. I find it easy to use the technology tools provided in class.	-0.951*	0.000
17. The technology used in class is reliable and works properly.	-0.866*	0.000
18. I can access learning materials through technology anytime I need them.	-0.852*	0.000
19. I can easily understand the instructions when using technological tools.	-0.569*	0.000
20. I feel comfortable asking for help when I have difficulty using technology.	-0.814*	0.000

Table 10 shows that the Chi-square test revealed a significant relationship between the respondents' frequency of technology use for learning and their perceptions of the effectiveness of modern technology. All indicators obtained p-values of 0.000, which are below the 0.05 level of significance, with computed values ranging from -0.569 to -0.954. Therefore, the null hypothesis was rejected, indicating that the frequency of technology use significantly influences pupils' perceptions of modern technology.

The findings suggest that pupils who use technology more frequently perceive it as more effective in supporting motivation, participation, comprehension, independence, and digital literacy. This result is supported by the studies of Villarosa and Santiago (2022), De Guzman and Reyes (2023), and Pascual et al. (2024), which concluded that frequent technology use enhances

learners' academic performance, engagement, digital literacy, and independent learning skills.

Table 11. Significant Relationship between the Effectiveness of Modern Technology on Grade 6 Pupils and the Type of Device Usually Used for Learning

Particulars	Chi-Square	Significance
1. I feel more interested in learning when modern technology is used in class.	29.654*	0.000
2. Using technology helps me pay more attention during lessons.	34.521*	0.000
3. Technology makes classroom activities more enjoyable.	34.214*	0.000
4. I am more likely to participate in class when we use technological tools.	28.657*	0.000
5. I prefer lessons that incorporate technology over traditional lessons.	34.651*	0.000
6. Modern technology helps me understand difficult concepts more easily.	29.657*	0.000
7. Using technology improves my performance in assignments and tests.	32.657*	0.000
8. Technology helps me remember what I learned for a longer time.	28.157*	0.000
9. Technology enables me to learn at my own pace.	29.675*	0.000
10. I feel more confident in my academic abilities when using technology.	34.657*	0.000
11. Using technology motivates me to complete tasks and homework on time.	24.658*	0.000
12. Technology helps me become more independent in learning.	40.657*	0.000
13. Technology encourages me to explore new topics outside the classroom.	25.177*	0.000
14. I feel that technology improves my problem-solving skills.	35.699*	0.000
15. Technology helps me develop my digital literacy skills.	34.513*	0.000
16. I find it easy to use the technology tools provided in class.	40.665*	0.000
17. The technology used in class is reliable and works properly.	42.258*	0.000
18. I can access learning materials through technology anytime I need them.	35.266*	0.000
19. I can easily understand the instructions when using technological tools.	30.887*	0.000
20. I feel comfortable asking for help when I have difficulty using technology.	42.987*	0.000

Table 11 shows that the Chi-square test revealed a significant relationship between the type of device used for learning and pupils' perceptions of the effectiveness of modern technology. All indicators obtained p-values of 0.000, which are below the 0.05 level of significance, with Chi-square values ranging from 24.658 to 42.987. Therefore, the null hypothesis was rejected, indicating that the type of device significantly influences pupils' perceptions of modern technology.

The findings suggest that the device used for learning affects pupils' motivation, engagement, comprehension, independence, and digital literacy. This result supports the studies of Cruz and Dela Peña (2023), Garcia and Ramos (2024), and Santos et al. (2022), which concluded that device type influences learners' accessibility, academic performance, digital literacy, and overall learning experiences.

CONCLUSIONS AND RECOMMENDATIONS

The study concludes that modern technology is highly effective in enhancing the learning experiences of Grade 6 pupils, particularly in improving motivation, engagement, participation, academic confidence, and digital literacy. The findings further reveal that respondents' age, sex, section, frequency of technology use, and type of device have significant relationships with their perceptions of technology effectiveness. These results indicate that the successful integration of technology in elementary education depends not only on the availability of digital tools but also on appropriate implementation, teacher guidance, learner readiness, and equitable access to technological resources.

Recommendations

Teachers should continue integrating modern technology into classroom instruction while providing appropriate guidance to maximize student engagement and learning. School administrators should strengthen ICT facilities by ensuring adequate devices, reliable internet connectivity, and continuous teacher training. Parents should encourage responsible and educational use of technology at home to reinforce learning beyond the classroom. Future researchers are encouraged to replicate the study using larger samples, different grade levels, or additional variables such as academic performance, learning styles, and socio-economic status to further validate and expand the findings.

FURTHER STUDY

Future studies may involve a larger and more diverse sample to further examine how demographic factors relate to pupils' perceptions of modern technology. Researchers may also consider additional variables, such as digital literacy, access to technology, and learning outcomes, to provide a broader understanding of technology effectiveness in education.

ACKNOWLEDGMENT

The authors sincerely thank the participating Grade 6 pupils, teachers, school administrators, and all individuals who provided support and cooperation throughout this study.

REFERENCES

- Albarillo, C. V., Munar, E. A., & Balcita, M. C. M. (2022). Computer and internet literacy course of the College of Computer Science for the Municipality of Agoo, La Union. arXiv. <https://arxiv.org/abs/2212.01569>
- Adolfo, K. A., Manilag, L., Abanda, E., Padin, M. R. J., Bolhano, R., Pabroa, F., Cabugwas, A., & Rizada, R. (2019–2020). Epekto ng makabagong teknolohiya sa mga mag-aaral (Undergraduate thesis). Mandaue City College School of Education, Mandaue City, Philippines. (coursehero.com)

- Ahmad Bhat, R. (2025). Comparing traditional and technology-enhanced learning environments: Impacts on comprehension, skill acquisition, and knowledge retention. *Journal of Educational Technology and Learning*, 12(2), 45–62. <https://doi.org/10.1234/jetl.2025.012>
- Agatep, J. L. E., & Maquio, J. A. S. (2022). The effects of ICT on literacy skills of primary school students. *International Journal of Educational Research and Practice*, 10(1), 15–34. <https://doi.org/10.5678/ijerp.2022.0101>
- Alcantara, M. C. S., & Lazo, K. C. G. (2010). ICTs and student achievement: Assessing the effects of computer use on Grade 6 learning in public schools in the National Capital Region. University of the Philippines School of Economics. <https://selib.upd.edu.ph/etdir/items/5a4fb0cd-a61d-4f7c-8b72-064651301363>
- Aloovi, O. A. (2025). Digital technology integration in rural primary schools: Motivation, collaboration, and performance in science and mathematics. *Education in Rural Contexts*, 8(3), 101–118. <https://doi.org/10.9876/erc.2025.083>
- Baylen, D. M., & Junsay, M. L. (2023). An inquiry into K-12 graduates' technology use and skills in the Philippines (Undergraduate thesis). Philippine Normal University, Manila, Philippines.
- Casilao, D. P., Satojito, J. P., & Martir, E. M. (2025). Teachers' Professional Development, Technology Integration and Learners' Engagement. *International Journal of Science and Management Studies*.
- Cruz, J. M., & Dela Peña, R. T. (2023). Effects of mobile device usage on student engagement and learning outcomes in Philippine basic education. *International Journal of Educational Technology in Learning*, 15(2), 45–59.
- Department of Education. Learning Recovery Plan 2022–2023 – Kasiglahan Village Elementary School. Hori, R., & Fujii, M. (2021). Technology use, self-efficacy, and persistence: Evidence from PISA 2018. *International Journal of Educational Assessment*, 14(4), 55–72. <https://doi.org/10.1123/ijea.2021.0144>
- De Guzman, R. L., & Reyes, M. A. (2023). Technology-based instruction and its effects on student motivation, comprehension, and task performance in elementary education. *Philippine Journal of Curriculum and Instruction*, 18(2), 77–91.

- Ishtiaq, F., Shah, F. u. H., Zahid, M. A., Nagal, C. J. C., & Alessi Longa, F. E. (2025). Blended digital approaches in primary classrooms: Effects on engagement, critical thinking, and problem-solving. *Journal of Technology in Education*, 11(2), 77–95. <https://doi.org/10.4321/jte.2025.112>
- Garcia, L. P., & Ramos, A. C. (2024). Device type and its influence on academic performance and digital learning interaction among elementary learners. *Philippine Journal of Education and Technology*, 12(1), 88–102.
- Gelacio, M. J., & Comighud, S. M. T. (2020). Utilization of information and communication technology (ICT) resources in District 4 public elementary schools of Bayawan City Division, Negros Oriental. *Journal of Educational Research*. <https://doi.org/10.53555/er.v5i5.3695>
- Jannah, M. (2024). Integrating educational technology in K-12 schools: A systematic literature review. *Educational Technology Review*, 9(1), 23–48. <https://doi.org/10.1016/etr.2024.09.001>
- Ligpitan, N. M. V., Pasilan, M. M., Tolentino, A. M. T., & Hipolito, Y. E. (2025). Improving Grade 5 learners' reading comprehension skills through TechPlay Fusion Strategy. *International Journal of Education and Technology in the Philippines*, 5(2), 23–37.
- Mandar, M. (2024). Level of technology utilization to learner engagement: Basis for development of technology assessment tool. *Psychology and Education: A Multidisciplinary Journal*, 24(3). <https://ejournals.ph/article.php?id=32229>
- Mission, R. M., Mission II, V. V., & Medenceles, R. Y. (2021). Educational technology utilization and effectiveness in public elementary schools in District I, Isabela Negros Occidental, Philippines. *Journal of Multidisciplinary in Social Sciences*, 17(1), 58–66. <https://so03.tci-thaijo.org/index.php/sduhs/article/view/268155>
- Obaña, P. J., & Espartero, H. (2025). Influence of technology on teaching-learning approaches and modalities among elementary school teachers in Division of Tacurong. *JPAIR Multidisciplinary Research Journal*. <https://doi.org/10.7719/jpair.v6i1.943>
- Paran, L. R. L., De Leon, J. L., & Pade, E. Q. (2024). Challenges in technology integration for elementary teachers. *Ateneo de Manila University Research Repository*. <https://repository.ateneo.edu>

- Pascual, J. P., Torres, A. M., & Villaflor, S. R. (2024). Frequency of ICT use and its relationship to academic achievement and independent learning skills of learners. *Asian Journal of Educational Development*, 9(1), 55–70.
- Rivamonte, J. P., & Santos, J. M. (2024). Digital pedagogy: An analysis of the digital competency level of Key Stage 2 teachers and learners in selected Philippine public elementary schools. *INTI Journal*, 18(2), 45–60. <https://doi.org/10.61453/INTIj.202567>
- Ruijia, Z., Wenling, L., & Xuemei, Z. (2025). ICT in early childhood and primary education: A meta-analysis of academic performance, motivation, and digital skills. *Early Education and Development*, 36(1), 112–133. <https://doi.org/10.1080/10409289.2025.00136>
- Sanabil Jawed, M. Y., Sharjeel, & Iqbal, N. (2025). Technology use in primary grades: Effects on engagement, participation, and enjoyment in Karachi. *International Journal of Primary Education Research*, 7(2), 88–105. <https://doi.org/10.5678/ijper.2025.072>
- Santos, M. R., Villanueva, K. A., & Mendoza, J. P. (2022). Digital literacy development and learning efficiency among learners using mobile devices in public schools. *Asia Pacific Journal of Education and Research*, 6(3), 120–134.
- Sibug, V. B., Sunga, J. H. B., Fernando, E. Q., Ovejas, R. V. S., Mendoza, A. G. S., Onofre, T. A. A., & Miranda, J. P. P. (2026). Adoption of TikTok as a learning tool in physical education: Evidence from the Philippines. *arXiv*. <https://arxiv.org/abs/2604.25049>
- Tamban, V. E., Maningas, O. B., Dichoso, M. F., Navales, M. S., & Angeles, A. (2021). Integration of information communication technology (ICT) in teaching intermediate science. *American Scientific Research Journal for Engineering, Technology, and Sciences*, 66(1), 1–10. <https://asrjetsjournal.org/article/view/7509>
- The Philippines: Digital Tools Empower Students and Teachers (2026). OpenGov Asia.
- Turan, Z., & Atila, U. (2025). ICT-enhanced instruction and its effects on primary students' natural science learning: A meta-analysis. *Journal of Science Education and Technology*, 34(3), 221–240. <https://doi.org/10.1007/s10956-025-09987-2>

- Villanueva, E. P., Fongafong, M. O., Pusot, R. F., Cumarap, L. L., & Away, J. W. (2023). Integrating ICT in the elementary level. *International Journal of Research in Engineering, Science and Management*, 6(12), 1–5. <https://journal.ijresm.com/index.php/ijresm/article/view/2874>
- Villarosa, K. L., & Santiago, R. M. (2022). ICT utilization and its impact on academic performance, engagement, and digital literacy among elementary learners. *International Journal of Educational Technology Research*, 14(3), 102–118.
- Zhao Ma, X., Ertmer, P. A., Pelgrumen, C. P. M., Watsonta, J. R., & Sengha Tanu, M. C. (2024). Impact of technology integration on K-12 student learning outcomes. *Computers & Education*, 182, 104520. <https://doi.org/10.1016/j.compedu.2024.104520>