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DIGITAL AND CRITICAL THINKING SKILLS AMONG ELEMENTARY LEARNERS

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ABSTRACT

This study determined the level of digital integration among elementary learners across technology usefulness, accessibility, digital skills, and attitude toward technology, alongside their critical thinking skills in analyzing information, evaluating and reasoning, decision-making and problem solving, and reflection and metacognition. It also established relationships between these digital dimensions and critical thinking development. Specifically, the research measured these factors, assessed qualitative levels ("Very Highly Educational," "Highly Extent"), and identified significant correlations predicting higher-order thinking gains. Employing a descriptive-correlational design, data from elementary learners were gathered via validated surveys and analyzed using descriptive statistics (means, standard deviations, qualitative interpretations) and Pearson Product-Moment Correlation. Technology usefulness was rated "Very Highly Educational," with learners perceiving strong enhancements in participation, motivation, comprehension, and academic performance. Accessibility, digital skills, and attitude toward technology rated "Highly Educational," excelling in basic operations and enthusiasm but moderated by troubleshooting, online safety, source evaluation, and resource equity challenges. Critical thinking skills consistently rated "Highly Extent" across domains: analyzing information excelled in questioning and fact-opinion distinction; evaluating and reasoning in rationale explanation; decision-making/problem solving in creativity; reflection/metacognition in responsibility and post-activity review. Correlation analysis revealed significant positive relationships ($p < .001$): accessibility ($r=.624$), attitude ($r=.526$), digital skills ($r=.518$), and usefulness ($r=.283$). These

confirm reliable access as the primary enabler of sustained practice, complemented by positive mindsets and emerging competencies driving analytical depth. The findings underscore equitable infrastructure, mindset cultivation, and skill-building as essential for fostering 21st-century critical thinkers through digital integration.

***KEYWORDS*:** digital integration, elementary learners, critical thinking skills, technology accessibility, digital skills, technology attitude.

INTRODUCTION

As a Grade 6 teacher, the motivation for this study emerged from classroom observations showing that many learners struggled to apply critical thinking when confronted with problem-solving tasks, inquiry activities, and real-world scenarios, despite frequent exposure to digital tools. Learners tended to rely on recall and surface-level responses, finding it difficult to analyze information, justify their answers, or consider alternative viewpoints during discussions and performance tasks, even when technology was integrated. In many lessons, available technologies such as tablets, projectors, and online resources were used mainly for presenting content rather than engaging learners in interactive, reflective, and higher-order thinking processes, which mirrors broader concerns in the literature about technology being underutilized for critical thinking development. These recurring experiences in the Grade 6 classroom prompted a deeper reflection on how educational technology might be designed and implemented more intentionally to support active inquiry, reasoning, and evaluation, ultimately leading to the decision to investigate how technology-enhanced teaching practices can more effectively foster learners' critical thinking skills.

However, developing these skills isn't always easy. Many classrooms still rely heavily on traditional teaching methods that focus on memorizing facts rather than truly understanding ideas. This can make it tough for students to practice critical thinking. Teachers themselves often face challenges like limited time, not enough training in using new technologies, or not having the right digital tools at their disposal. These obstacles make it hard for teachers to fully use technology to boost their students' critical thinking.

One of the biggest gaps we see today is that interactive and tech-based teaching methods, those that get students more involved through reflection and problem-solving, aren't widely used enough. Although technology offers exciting opportunities to create personalized and engaging learning experiences, many teachers struggle to incorporate it into their lesson

plans. Reasons include lack of training, hesitation to shift from familiar methods, and sometimes technical issues.

Despite these hurdles, there are promising examples where technology tools—like interactive whiteboards, online platforms for teamwork, and inquiry-based learning activities help students think more deeply. These tools encourage learners to engage actively with content, consider different points of view, and use higher-level thinking skills, which supports their overall cognitive growth and helps them become more aware of their own thinking processes.

What really matters is how teachers combine their teaching strategies with technology. This means rethinking how lessons are planned and delivered—moving beyond just "telling" to creating opportunities for students to ask questions, evaluate ideas, and reflect on their learning. When technology is blended with interactive and inquiry-based approaches, it fosters classroom environments where students feel more independent and engaged, helping bridge the gap between traditional learning and today's educational needs.

This study explored how educational technology can be used thoughtfully to improve critical thinking skills among learners. It looks at the challenges teachers experience and investigates how technology-supported teaching can encourage active, thoughtful, and analytical learning. The goal is to offer practical ideas for teachers and curriculum planners to make the best use of digital tools and better prepare students for the complexities of the modern world.

Framework of the Study

Two well-established theoretical frameworks suitable for studying educational technology are Constructivist learning theory and Socratic Method for Critical thinking in Elementary learners.

The present study was anchored on two complementary theoretical perspectives, namely constructivist learning theory and the Socratic method of questioning, to explain the interrelationship between digital use and the development of critical thinking skills among elementary learners. The constructivist learning theory posits that learners actively construct knowledge by engaging with tasks, drawing on prior experiences, and negotiating meaning through social interaction, rather than merely receiving information passively from the teacher. Within this paradigm, educational technology functions as a key enabling condition that creates interactive, learner-centered environments where pupils can explore digital content, collaborate with peers, and engage in inquiry-based activities that require analysis, synthesis, and evaluation of information. The Socratic method, on the other hand, provides a

pedagogical lens for understanding how questioning strategies embedded in technology-enhanced lessons can scaffold and deepen learners' thinking processes by encouraging them to examine assumptions, justify responses, and consider alternative perspectives through guided dialogue.

In the context of this study, digital was conceptualized as the independent variable that affords constructivist, inquiry-oriented learning tasks and Socratic questioning opportunities, while learners' critical thinking skills constitute the dependent variable that emerges from sustained participation in such technology-mediated, dialogic learning experiences. Together, these theoretical frameworks suggest that the impact of educational technology on critical thinking is not inherent in the tools themselves but is realized through their alignment with constructivist principles and systematic use of Socratic questioning, thereby providing a coherent basis for examining how technology-supported instruction can foster higher-order thinking among Grade 6 learners.

The constructivist learning theory provides a strong foundation for understanding how learners develop critical thinking skills, emphasizing that knowledge is not simply absorbed but actively constructed by the learner. This theory highlights the importance of students engaging directly with content, encouraging them to explore, question, and reflect rather than passively receiving information. Through this active engagement, learners develop a deeper understanding by connecting new ideas with their prior knowledge, analyzing concepts, and synthesizing diverse pieces of information. Constructivism aligns well with the goals of educational technology because many digital tools are designed to create interactive, learner-centered environments. These technologies facilitate inquiry-driven learning experiences where students are prompted to experiment, collaborate, and critically evaluate content, thus promoting the development of higher-order thinking skills essential for critical thinking.

Complementing constructivism is the Socratic method of questioning, a pedagogical approach traditionally aimed at fostering deep critical thinking through guided dialogue and probing questions. This method encourages learners to reflect on their assumptions, analyze underlying ideas, and articulate their reasoning clearly. In the context of educational technology, many modern learning platforms incorporate variations of the Socratic method by using carefully designed questions to scaffold learners' thinking processes. Although replicating the dynamic, personalized interaction of an in-person Socratic dialogue can be challenging for digital tools, technology-enabled learning environments often adopt a contemporary approach by embedding open-ended, thought-provoking questions that

stimulate analysis, evaluation, and reflection. These guided questions help learners move beyond surface-level understanding to engage more deeply with content, thereby nurturing critical thinking skills in a way that aligns with constructivist principles. Together, these theories support the strategic use of technology to create interactive, reflective, and inquiry-based learning experiences that actively develop learners' critical thinking abilities.

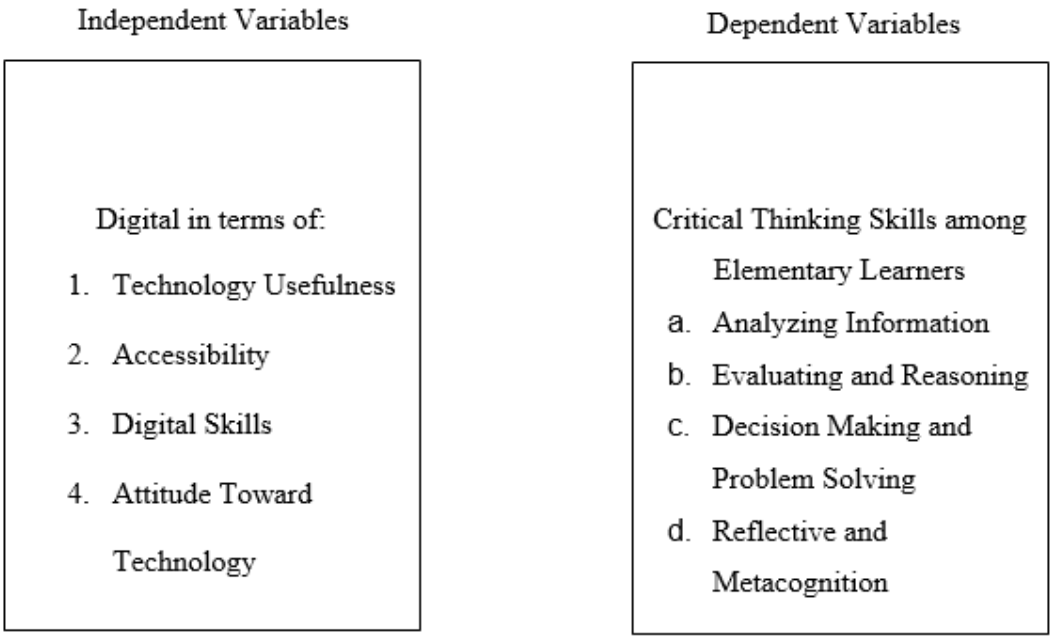

Figure 1. Schematic diagram of the study showing the relationship between independent and dependent variables.

Statement of the Problem

This examined the level of Digital and Critical Thinking Skills among Elementary Learners in District 3 in the Division of Valencia City for School Year 2025-2026.

Specifically, this study sought to answer the following questions:

1. What is the level of digital in terms of: a. Technology usefulness, b. accessibility, c. digital skills, and d. attitude toward technology?

2. What is the extent of critical thinking skills among elementary learners in terms of a. analyzing information, evaluating and reasoning, decision making and problem solving, and reflective and metacognition?

3.Is there a significant relationship between the level of digital and critical thinking skills among elementary learners?

Significance of the Study

The result of this study will be a valuable basis for planning, and the results will be beneficial to the following.

This study holds significance for various stakeholders involved in the educational process, each benefiting in unique ways from understanding and improving the integration of educational technology to foster critical thinking skills. This research aims to provide valuable insights for various beneficiaries:

For learners, this study aimed to enhance their critical thinking abilities, equipping them with essential skills such as analysis, evaluation, problem-solving, and reflection. By engaging with technology-driven instructional strategies, learners can become more active, independent thinkers who are better prepared to navigate complex information and solve real-world problems. This will ultimately support their academic success and lifelong learning.

Teachers gained insights into effective ways of integrating digital in their pedagogy to stimulate learners' critical thinking. The study highlights practical strategies and digital tools that can make lessons more interactive and inquiry-based, helping teachers overcome challenges like limited time and lack of training. This can improve teachers' professional competence and confidence in using technology as a catalyst for deeper learning.

For school administrators and heads, this research provided valuable information on how to support and promote the use of technology in classrooms effectively. Understanding the benefits and challenges revealed by the study can guide school heads in allocating resources, providing training, and establishing policies that foster a technology-rich learning environment conducive to developing critical thinking skills among learners.

The broader community benefited as young learners developed stronger critical thinking skills, enabling them to become responsible, informed citizens who can thoughtfully engage with societal issues. Enhanced learning outcomes contribute to a more knowledgeable and capable community workforce, which is vital for social progress and economic development.

This study offers curriculum designers evidence-based recommendations on integrating technology in instructional frameworks to promote critical thinking. It supports the ongoing evolution of curricula towards more learner-centered, technologically supported approaches, ensuring that educational content and methods remain relevant and effective in preparing students for the demands of the 21st century.

Delimitation of the Study

This research was delimited to find the significant relationship between the level of digital and critical thinking skills among elementary learners.

The independent variables were digital learning component in terms of technology usefulness, accessibility, digital skills, and attitude toward technology.

The dependent variable is critical thinking skills among elementary learners in School Year 2025-2026.

This study used a survey questionnaire that the researcher adapted. The respondents of this study are teachers of schools located in District 3, Division of Valencia City. The researcher treated the data with descriptive statistics such as frequency count, percentage, mean, standard deviation, t-test of significant difference, and Pearson's'r Product- Moment Correlation Coefficient.

A Review of Related Literature and Studies

Digital in terms of Technology usefulness

Technology integration in subjects such as mathematics using mobile applications, video lessons, and online collaboration platforms has also been shown to enhance student engagement and skill acquisition, thus supporting knowledge development aligned with the K-12 curriculum reforms (Capuno et al., 2019; Insorio & Macandog, 2022).

A systematic literature review of technology integration in the Philippine K-12 education system by Romero et al. (2023) indicated that emerging technologies like artificial intelligence, social media, and e-learning platforms positively impact learner knowledge and skills acquisition but face challenges related to infrastructure, teacher training, and student readiness. These findings point to the critical need for ongoing support mechanisms and policy reforms to maximize the usefulness of EdTech.

Moreover, a comprehensive ecosystem profile of Philippine EdTech described by Pouezevara (2020) captures the complexity of adoption, promotion, and scaling of technology in education within the country's socio-economic context. The report stresses opportunities to move beyond conventional methods and scale up equitable EdTech practices that improve teaching and learning outcomes.

Digital in terms of Accessibility

Technologies such as electronic Braille displays, adapted input devices (keyboards and mice), screen readers, speech recognition, and text-to-speech systems have been identified as essential tools to remove physical and sensory barriers, enabling students with disabilities to access educational content effectively (Srivastava et al., 2021; Chambers, 2020). Moreover, emerging technologies like augmented and virtual reality and educational robotics provide immersive, personalized learning experiences that can cater to individual needs, thereby enhancing engagement and cognitive development (Kuvshinova et al., 2019; Karagianni & Drigas, 2023).

The physical portability and user-friendliness of these digital tools contribute significantly to their accessibility, allowing use across varied learning environments (Karagianni & Drigas, 2023). Multisensory materials have also been noted to stimulate multiple senses, which is particularly beneficial for learners with sensory or cognitive impairments (Raja & Giannoumis, 2019). Additionally, accessibility goes beyond device availability to include reliability, security, compatibility, and continual updating of educational resources to meet evolving inclusivity standards (Chambers, 2020).

Digital in terms of Digital Skills

Digital skills encompass the ability to effectively use digital tools and platforms for learning, communication, collaboration, and critical thinking (Brooks et al., 2023; Murcia et al., 2018). As digital learning environments become more prevalent, these skills facilitate flexible and personalized instruction that enhances student engagement and improves learning outcomes through innovative approaches like flipped classrooms and blended learning (Kumbo et al., 2023; Zhao, 2024).

The development and strengthening of digital skills among educators is increasingly addressed through structured training and professional development programs. Outcomes of such initiatives include improved techno-pedagogical skills, enhanced motivation, and increased integration of digital tools that foster active and collaborative learning environments. Additionally, emerging educational technologies like artificial intelligence (AI) and interactive platforms contribute to personalized learning experiences by adapting to learner needs, automating feedback, and supporting critical thinking development (Ally & Wark, 2019; Holmes et al., 2019; Zawacki-Richter et al., 2019). These technological

advances underscore the imperative for learners and educators alike to develop robust digital skills to thrive in the 21st-century educational landscape.

Digital in terms of Attitude toward Technology

Attitude towards educational technology plays a critical role in its successful adoption and integration into teaching and learning processes. Research consistently shows that positive attitudes among both teachers and students significantly influence how effectively technology is used in educational settings.

In the context of teacher education, Saravanakumar, Raja, and Sivakumar (2023) emphasized the necessity of nurturing positive attitudes toward technology for effective pedagogical transformation. Teacher education programs that integrate technology-enhanced learning foster greater digital literacy and openness to technological innovations, resulting in more dynamic and learner-centered classrooms. Engaged and confident teachers are better equipped to implement technology that fosters critical thinking and problem-solving skills among learners (Saravanakumar et al., 2023).

Critical Thinking Skills

Critical thinking skills have been increasingly recognized as essential competencies for Filipino students to succeed academically and adapt to the demands of the modern world. Research indicates that critical thinking plays a pivotal role in academic success, especially among senior high school students, who face complex subject matter and preparation for higher education (Dela Cruz, 2019; Gonzalez & Reyes, 2022). The K-12 education reform in the Philippines has emphasized the development of critical thinking abilities as a priority, aiming to equip learners with skills for analyzing, evaluating, and synthesizing information effectively (DepEd, 2019, 2021).

Nonetheless, interventions such as collaborative-individual learning and problem-based learning have demonstrated positive impacts on students' critical thinking skills by encouraging active engagement and deeper analytical thinking (Viado & Espiritu, 2023; Importance of Critical Thinking, 2020). For example, problem-based learning approaches have been shown to be effective in improving critical thinking skills among secondary students in both academic performance and problem-solving abilities (Importance of Critical Thinking, 2020; IIARI, 2024).

Analyzing Information

Critical thinking in elementary education begins with analyzing information, where students break down complex data into components to understand relationships and structures. Research shows that elementary learners often struggle with distinguishing relevant from irrelevant details, leading to superficial comprehension unless guided by structured tasks. Interactive digital tools and inquiry-based activities significantly enhance this skill by prompting students to identify patterns and inconsistencies in presented information. Studies emphasize that teacher modeling of analytical processes during group discussions further strengthens learners' ability to dissect multifaceted problems systematically (Arifin, 2025).

Elementary students demonstrate improved analysis when exposed to problem-based scenarios that require examining multiple data sources. A meta-analysis revealed that collaborative tasks foster deeper information breakdown, as peers challenge initial interpretations and encourage evidence-based scrutiny. This process aligns with constructivist principles, where active manipulation of information builds analytical proficiency over rote memorization. Findings indicate moderate to high effect sizes in analytical gains from such interventions, particularly in science contexts (Liang et al., 2023).

Evaluating and Reasoning

Evaluating and reasoning require elementary students to assess evidence quality and logical coherence, skills essential for discerning valid arguments. Studies indicate that young learners frequently accept information at face value without scrutinizing credibility, necessitating explicit training in criteria-based evaluation. Technology-enhanced platforms with embedded prompts guide this process, leading to measurable gains in reasoning accuracy during debates and assessments (Facione, 1990).

Reasoning development thrives in environments promoting evidence weighing and counterargument consideration. Meta-analyses show collaborative problem-solving elevates evaluation skills, with effect sizes indicating superior outcomes from mixed-course formats over isolated instruction. This underscores reasoning as a social-cognitive interplay amenable to scaffolded digital interventions (Liang et al., 2023).

Elementary teachers' own reasoning models influence student evaluation practices, as observed in classroom discourse analyses. When educators pose evaluative questions, learners better distinguish facts from opinions, enhancing argumentative rigor. Such practices bridge gaps in reasoning typically seen in under-resourced settings (Amanda, 2024).

Decision-Making and Problem Solving

Decision-making and problem-solving in elementary learners involve generating viable options and selecting based on criteria, often undeveloped without real-world contexts. Literature stresses play-based and project-based methods to simulate choices, boosting confidence in complex scenarios. Digital simulations amplify this by allowing risk-free trial-and-error (Brown, 1986).

Collaborative problem-solving markedly advances decision-making, with meta-evidence showing high attitudinal and cognitive gains. Group dynamics encourage diverse perspectives, refining selection processes in ambiguous problems common to elementary curricula (Liang et al., 2023).

Reflection and Metacognition

Reflection and metacognition enable elementary students to monitor thinking processes, adjusting strategies for better outcomes. Explicit metacognitive instruction, like think-alouds, cultivates self-awareness critical for sustained skill growth Abrami et al., (2015). Reflective writing reinforces metacognition, which is reciprocal evident in self-regulated critical thinking gains during problem-solving. Social-cognitive perspectives highlight teacher scaffolding's role (Social Cognitive Perspective Study, 2022).

Metacognitive strategies evolve with age; teacher interventions are vital for younger learners' independent reflection. Early development links to social skill enhancement (Wang et al., 2024).

In elementary contexts, reflective questioning fosters metacognitive depth, synergizing with teaching practices for critical thinking Paradigm Press, (2024).

Story-based reflection nurtures metacognition, aligning with constructivist active knowledge building (Nuraini et al., 2020).

The Methodology

Research Design

This study employed the descriptive-correlation design. It will examine the level of the digital literacy among the teachers in District 3, Valencia City Bukidnon, for the school year 2025-2026.

Researchers obtained data on the level of fostering critical thinking Skills through an adapted questionnaire.

Research Locale

The researcher conducted the study in the Division of Valencia City District 3. Valencia City was a fast-growing city in terms of economy and development in Northern Mindanao.

District III was a highly competitive and performing district school among the many in the Division of Valencia. It is run and headed by a leader with our District Focus Supervisor, Noemie M. Pagayon. It consists of 6 schools, specifically Araneta Elementary School, Batangan Integrated School, Lumbayao Elementary School, San Isidro Elementary School, Sinabuagan Integrated School, and Vintar Elementary School.

FINDINGS

The level of digital integration in terms of technology usefulness, accessibility, digital skills, and attitude toward technology was very highly educational.

The critical thinking skills for learners in terms of analyzing information, evaluating and reasoning, decision making and problem solving, and reflective and metacognition were to a very large extent.

There was a significant relationship between the level of digital and critical thinking skills among elementary learners.

CONCLUSIONS

The level of digital integration among elementary learners was very high in terms of technology usefulness, highly educational in accessibility, digital skills, and attitude toward technology. The findings indicate that learners strongly perceive digital tools as transformative for participation, motivation, and academic engagement, with strengths in basic operations and enthusiasm, though moderated by challenges in troubleshooting, online safety, and resource equity. The high extent of critical thinking skills across analyzing information, evaluating and reasoning, decision-making and problem solving, and reflection and metacognition highlights foundational competence with affective strengths like curiosity and ownership.

The findings indicate that there were statistically significant positive correlations between each digital dimension and critical thinking indicators. Accessibility exhibited the strongest association, illustrating how reliable infrastructure enables sustained practice in analysis, reflection, and creativity, while positive attitudes fuel motivation and emerging skills support

evidence evaluation. This interconnected framework surpasses fragmented tech use, affirming the superiority of equitable, mindset-driven integration over isolated tool deployment.

The findings endorse institutionalizing accessible devices, success-oriented experiences, targeted digital fluency training, and demonstrated tool value within elementary programs. This suggests that by prioritizing infrastructure equity, enthusiasm cultivation, and scaffolded competencies, educational stakeholders can systematically develop analytical, resilient, and metacognitive thinkers. Hence, continuous professional development in edtech integration and hybrid strategies proves imperative to nurture 21st-century proficiency and equip learners for complex cognitive demands.

The null hypothesis was hereby not accepted.

Recommendations

Given that the level of digital integration among elementary learners was found to be very highly educational in technology usefulness and highly educational in accessibility, digital skills, and attitude toward technology, it is recommended that schools continue to sustain and institutionalize these best practices. Regular monitoring and evaluation should be conducted to ensure that digital integration remains consistent and effective. Additionally, schools may enhance their programs by prioritizing sustained investment in reliable school-based digital infrastructure, such as stable internet hotspots and shared device pools, integrating continuous professional development on advanced training in source evaluation, online safety protocols, and patience-building strategies, and expanding awareness campaigns for parents and learners. These initiatives will help maintain a culture of accessibility, competence, and shared enthusiasm in promoting digital integration within the school community.

Since the critical thinking skills of learners were found to be to a high extent characterized by strengths in analyzing information, evaluating and reasoning, decision-making and problem solving, and reflection and metacognition, it is recommended that schools sustain and strengthen programs that promote critical thinking proficiency. Initiatives such as structured digital activities emphasizing abstract scrutiny, like error-detection games and AI-assisted reflection prompts, play-based tech integration, and daily lesson scaffolding should be continuously implemented to nurture these competencies. Teachers and administrators may also be encouraged to provide consistent mentoring and targeted interventions to maintain learners' analytical resilience and metacognitive growth, especially during technical challenges. Furthermore, collaboration among parents, community partners, and edtech

specialists should be enhanced to create a holistic and supportive environment that continually fosters learners' critical thinking and overall cognitive development.

Since the study revealed statistically significant positive correlations between each digital dimension and critical thinking indicators, it is recommended that schools and education stakeholders in District III, Division of Valencia City, adopt a more interconnected approach to promoting 21st-century skills. While maintaining strong digital integration practices remains essential for enabling foundational competence, schools should also focus on complementary interventions that leverage these relationships. These may include establishing collaborative teacher networks for sharing best practices, piloting grant-funded tech-literacy programs, conducting annual assessments linking digital access to critical thinking gains, and professional development workshops drawing from the total population sampled. Further research may also be conducted to expand this total population approach to comparative studies across divisions, incorporating longitudinal tracking of learner outcomes. Through these efforts, schools can develop a more comprehensive framework that safeguards both digital proficiency and advanced cognitive demands for every learner.

REFERENCES:

1. Abrami, P. C., et al. (2015). Strategies for teaching students to think critically. Review of Educational Research.
2. Ally, M., & Wark, N. (2019). Technology in education and skill development. SSRN. https://doi.org/10.2139/ssrn.1234567
3. Amanda, F. F. (2024). Enhancing critical thinking and problem-solving skills. REMIE: Multidisciplinary Journal of Educational Research.
4. Arifin, Z. (2025). The effect of inquiry-based learning on students' critical thinking skills in science education: A meta-analysis. Eurasia Journal of Mathematics, Science and Technology Education.
5. Brooks, D., Murcia, K., & Leavy, A. (2023). Digital literacy in education: Preparing learners for a digital world. Journal of Digital Learning, 12(3), 45–60.
6. Brown, R. (1986). Using children's literature to develop decision making skills. ScholarWorks@UNI.
7. Campado, R. J., Toquero, C. M. D., & Ulanday, D. M. (2023). Integration of assistive technology in teaching learners with special educational needs and disabilities in the

Philippines. International Journal of Professional Development, Learners and Learning, 5(1), Article ep2308. https://doi.org/10.30935/ijpdll/13062

8. Chambers, D. (2020). Ensuring accessibility and adaptability in educational technology. Educational Technology Research and Development.
9. Cruz, M. T., Garcia, R. F., & Santos, L. P. (2021). Exploring contributing factors on poor digital literacy of students in the Philippines. International Journal of Research in Social Sciences, 11(3), 45-58.
10. Dela Cruz, J. (2019). Critical thinking skills and academic success among senior high school students. Philippine Journal of Education Studies.
11. Dela Cruz, J. (2019). The role of critical thinking skills in academic success of students [Unpublished study]. Magsaysay.
12. Department of Education (DepEd). (2019). K to 12 basic education curriculum guide. Department of Education Philippines.
13. Department of Education (DepEd). (2021). Enhanced curriculum implementation plan. Department of Education Philippines.
14. Espinosa, A. A., Gomez, M. A. C., Miranda, P. A., David, A. P., Abulon, E. L. R., Hermosisima, M. V. C., Quinosa Jr., E. A., Soliman, A. A., De Vera, J. L., Claros, I. H. A., Cruz, H. G. M., & Gonzales, N. S. J. (2023). Technology in education: A case study on the Philippines (Background paper prepared for the 2023 Global Education Monitoring Report: Technology and Education, Southeast Asia). UNESCO.
15. Facione, P. A. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction. The Delphi Report.
16. Fulguera, R., & Bautista, S. (2020). Flipped learning approach in enhancing critical thinking skills and reading comprehension of senior high school ESL learners. Asian Journal of Learning and Instruction, 9(3), 21-38.
17. Garcia, R. F., & Santos, L. P. (2020). The digital divide and educational inequalities among Filipino students. Philippine Journal of Education and Technology, 5(2), 22-33.
18. Gonzalez, M., & Reyes, L. (2022). The role of critical thinking skills in academic achievement among Filipino learners. International Journal of Educational Research, 58(4), 123-135.
19. Gusho, L., Muçaj, A., Petro, M., & Vampa, M. (2023). The use of educational technology to improve the quality of learning and teaching: A systematic research review

and new perspectives. International Journal of Emerging Technologies in Learning, 18(15), 109–119.

20. Gusho, L., Muçaj, A., Petro, M., & Vampa, M. (2024). Advancing education through technology integration, innovative pedagogies, and emerging trends: A systematic literature review. Journal of Advanced Research in Applied Sciences and Engineering Technology, 41(1).
21. Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.
22. Howard, et al. (2016). [Interactions promoting solutions]. As cited in Amanda (2024).
23. IIARI. (2024). Problem-based learning strategies and critical thinking skills among pre-service teachers in the Philippines. International Institute for Advanced Research and Innovation Journal.
24. INJOTEL. (2024). Problem-based learning in elementary critical thinking. International Journal of Teaching and Learning.
25. Insorio, P., & Macandog, D. (2022). Video lessons via YouTube as Grade 7 Mathematics intervention in modular distance learning. Philippine Educational Technology Review, 15(1), 30-42.
26. Julianto, et al. (2023). Profile of critical thinking of elementary school students. International Journal of Multicultural and Multireligious Understanding.
27. Karagianni, C., & Drigas, A. (2023). Educational technology tools and their role in promoting inclusive learning environments. Journal of Inclusive Education.
28. Kumbo, N., & Zhao, Y. (2023). Innovative digital learning approaches in modern education. Journal of Educational Technology, 39(2), 156–173.
29. Lee, M.-H., & Tsai, C.-C. (2021). Exploring the relationship between technology use and learning engagement among elementary students. Journal of Educational Technology & Society, 24(2), 45–57.
30. Liang, N., et al. (2023). The effectiveness of collaborative problem solving in promoting students' critical thinking: A meta-analysis. Humanities and Social Sciences Communications, 10(1), Article 15. https://doi.org/10.1057/s41599-023-01508-1
31. Loinenko, M., & Huzar, O. (2023). Development of critical thinking in the context of digital learning. Economics & Education, 8(2), 29-45.
32. Lubis, A. N., et al. (2025). The role of digital literacy and learning motivation in students' critical thinking skills. *Global Education Journal*.

33. Mendoza, J. R., & Rivera, S. G. (2023). Integrating digital literacy programs in Philippine schools: Challenges and prospects. Asian Journal of Educational Research, 15(1), 101-115.
34. Nueva, M. G. C. (2019). Filipino teachers' attitude towards technology — Its determinants and association with technology integration practice. Asia-Pacific Social Science Review, 19(3), 167–184.
35. Nuraini, N. L. S., et al. (2020). Critical thinking and reflective thinking skills in elementary school learning. Proceedings of the 1st International Conference on Early Childhood and Primary Education, 125-130. https://doi.org/10.2991/assehr.k.201105.025
36. Pascua, R. B. (2025). The influence of digital literacy and information literacy on critical thinking skills. *EPRA International Journal of Multidisciplinary Research*
37. Paradigm Press. (2024). Metacognition and reflective teaching. Research and Advances in Education.
38. Philippine Institute for Development Studies. (2023). Educational challenges in the Philippines: Technology access and equity (PIDS Policy Note 2023-05).
39. Pouezevara, S. (2020). Philippines EdTech ecosystem profile. RTI International. (Prepared for USAID under the All Children Reading-Philippines Project).
40. Qondias, et al. (2022). [Study on multicultural problem-based learning]. Multidisciplinary Review.
41. Ramnarain, U. (2023). The effect of inquiry-based learning on students' critical thinking skills in science education: A meta-analysis. European Journal of Science Education, 15(4), 202-218.
42. Reyes, P. M., & Villanueva, K. M. (2022). Impact of the COVID-19 pandemic on digital literacy among Filipino learners. Philippine Educational Review, 27(4), 79-91.
43. Rittle-Johnson, B. (2006). Promoting transfer: Effects of self-explanation and direct instruction. Child Development, 77(1), 1-15.
44. Rivas, L., et al. (2022). Impact of critical thinking on academic performance and cognitive development. Journal of Educational Psychology, 114(5), 980-995.
45. Romero, F., Del Rosario, L., & Santos, M. (2023). Assessing the impact of emerging technology integration on knowledge and skills acquisition of K-12 students in the Philippines: A systematic literature review. International Journal of Educational Technology Research, 10(1), 103-117.

46. Santos, A. L., Alquiza, M. S., & Rico, L. J. (2023). Digital literacy and digital competence of selected Filipino teachers: Basis for a post-pandemic pedagogy. International Journal of Recent Educational Research, 4(5), 548-569.
47. Santos, R., & Cruz, E. (2023). Critical thinking and academic success in the Philippine context. Philippine Educational Review, 4(1), 45–60.
48. Saravanakumar, A. R., Raja, G. P., & Sivakumar, P. (2023). Transforming education: Perceptions and challenges of technology-enabled teacher education programmes. Open Access Research Journal of Engineering and Technology, 5(2), 001–007.
49. Sari, Y. P., et al. (2021). The correlation between digital literacy and parents' roles towards elementary school students' critical thinking. *Cypriot Journal of Educational Sciences*
50. Sarigoz, G., & colleagues. (2022). Development of Critical Thinking Skills Scale for Science Lesson. European Journal of Education Studies.
51. Sari, D. P., et al. (2021). Critical thinking skills and their impacts on elementary school students. Journal of Education and Learning, 15(3), 123-135.
52. https://eric.ed.gov/?id=EJ1319487
53. Social Cognitive Perspective Study. (2022). Reflective writing supports metacognition. Computers and Education Open.
54. SSRN. (n.d.). [Title not provided]. https://doi.org/10.2139/ssrn.1234567
55. Sotillo, J. A. (2024). Impacts of technology access to the learning skills of senior high school students. *Ascendens Asia Journal of Multidisciplinary Research*
56. Strat, M., et al. (2024). Integration of technology-enhanced inquiry learning in classrooms across continents. International Journal of Educational Technology, 19(1), 88-103.
57. UNESCO. (2023). *Technology in education: A case study on the Philippines*.
58. Viado, A. L., & Espiritu, J. A. (2023). The collaborative-individual learning in improving the critical thinking skills of secondary students in the Philippines. International Journal of Multidisciplinary: Applied Business and Education Research.
59. Wang, Y., et al. (2024). Research on metacognitive strategies of children's self-regulated learning. Frontiers in Psychology.
60. Zulnaidi, H., et al. (2025). Improving digital literacy and critical thinking skills of elementary school students. *Proceedings of the 5th ICoISSEE*.