UNDERSTANDING DIGITAL COMPETENCE ACROSS EDUCATIONAL SETTINGS: EXPERIENCES OF STUDENTS, AND TEACHERS

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KEYWORDS

21st-Century Skills, Digital Competence, Educational Innovation, ICT In Education, Teaching and Learning, Technology Adoption

ABSTRACT

The study "Understanding Digital Competence Across Educational Settings: Experiences of Students, and Teachers." The study aims to understand the digital competence across the educational settings based on the experience of students, and teachers College of Engineering, Computer Studies, Technology, and Liberal Arts (CECTLA) at Aemilianum College Inc. it employed a qualitative method to investigated how students and teachers understand, develop, and apply digital competence in an academic setting. The participants include a purposively selected group composed of (10) ten college students and five (5) college faculty members. Data were gathered through a focus group discussion and was analyzed using a thematic analysis to explore their lived experiences in the areas of digital literacy, communication and collaboration, digital content creation, safety, and problem-solving.

Findings revealed that both students and teachers generally perceive digital competence as essential in modern education. Participants demonstrated strengths in communication, collaboration, and basic digital literacy, particularly in using online platforms, social media, and productivity tools for academic tasks. However, challenges emerged in digital content creation, advanced technical skills, cybersecurity awareness, and access to reliable resources. Themes highlighted the importance of institutional support, training opportunities, and continuous exposure to technology. Participants emphasized that digital competence improves engagement, productivity, and adaptability but requires ongoing development through workshops, infrastructure, and curriculum integration.

The study concludes that while students and teachers possess foundational digital competence, there is a strong need for structured digital literacy programs to address skill gaps and ensure safe, ethical, and innovative use of technology in education. It is recommended that Aemilianum College Inc. implement continuous professional development, provide adequate technological resources, integrate digital competence into the curriculum, and conduct further research on long-term digital skills development. These initiatives may strengthen teaching and learning practices and better prepare the academic community for the demands of an increasingly digital educational environment.

INTRODUCTION

The rapid advancement of digital technologies has significantly transformed the ways people learn, teach and work. As digital tools become increasingly embedded in educational institutions and professional environments, digital competence has emerged as a crucial capability for individuals to effectively engage with technology. Digital competence involves not only technical skills but the ability to adapt, critically evaluate digital transformation and apply technology meaningfully in various contexts. However, the development of digital competence is shaped by individuals' experiences, roles and environments, highlighting the need to explore how different groups navigate and develop digital skills in both educational and professional settings.

Globally, individuals are expected to effectively use digital technologies to access information, communicate, collaborate and adapt to continuous technological change. As education systems and workplaces increasingly rely on digital tools, the development of digital competence is viewed as essential for lifelong learning, employability, and meaningful participation in the globally connected society (UNESCO, 2018; OECD 2020).

The European Commission's Digital Competence Framework for Citizens (DigComp) and UNESCO's ICT Competency Framework highlight that digital competence is a multidimensional construct encompassing information and data literacy, communication and collaboration, digital content creation, problem-solving, and ethical and responsible use of technology (European Commission 2019; UNESCO, 2018). These frameworks underscore the importance of attitudes, critical thinking and contextual application of digital skills, suggesting that digital competence is shaped by how individuals engage with technology within real educational and professional settings.

International perspectives emphasize that digital competence is a complex, multidimensional capability essential for effective participation in education and the workforce. While global frameworks provide structured definition and standards, they also highlight the importance of contextual and experiential factors in digital competence development.

In the Philippine context, the development of digital competence has become central to educational reform and instructional delivery, especially in the aftermath of the COVID-19 pandemic. Research on Filipino teachers' digital competence highlights both the progress and challenges present in basic and higher education's settings. According to Abella and Dela Rosa, Filipino teachers' digital literacy and competence are influenced by factors such as access to technologies, pre-service preparation, and attitudes toward ICT integration, suggesting that digital skills vary depending on contextual supports and individual's profiles of educators. Evidence conducted in the studies indicates disparities in infrastructure, training opportunities, and institutional support that affect the ability of Filipino teachers and learners to fully realize digital competence goals (Abella & Dela Rosa, 2023).

In addition, national discussions on workforce readiness emphasize the need for skills that extend beyond technical proficiency to include adaptability, communication and critical thinking in digital environments. Studies suggest that soft skills and digital fluency are increasingly important for employability and professional success, reinforcing the necessity of holistic digital competence frameworks that address both technical and contextual demands of work in the digital age. As the country continues to strengthen its digital infrastructure and workforce capabilities, understanding how Filipinos develop, encounter challenges with and apply digital skills across sectors remains an important focus for research and policy (Zaldarriaga, 2024).

Understanding the Filipinos attitude towards changes helps the industry to further progress in the digital age. Therefore, digital competence reflects both advancements and persistent challenges shaped by infrastructure, training opportunities and individual attitudes toward technology. National studies suggest that while policies and initiatives support digital transformation, disparities in access and implementation continue to affect educators, learners, and professionals.

In Bicol region, efforts to improve digital competence and digital inclusion are increasingly evident through government and institutional programs aimed at building digital skills and enhancing technology use. For instance, regional education stakeholders are implementing technology-enhanced learning initiatives such as the DREAM Bicol Project, which introduces AI-powered tools in classrooms to supports personalized learning and reduce administrative tasks for teachers (DOST Region 5, 2025). And the infrastructure projects by the

Department of Information and Communication Technology (DICT) V enhancing internet access and connectivity in remote schools and communities improve the digital connectivity improvements geographically isolated and disadvantaged areas of Bicol Region (Calipay, 2025).

Despite these initiatives, empirical studies specifically addressing digital competence among learners, educators and professionals in Bicol remain limited. For example, existing regional research on teachers' ICT competence has been conducted in nearby contexts such as Masbate, highlighting patterns in basic digital skills and areas for improvement (Mahawan & Guzman, 2025).

The growing emphasis on digital competence at the international, national and local levels, existing studies have largely focused on measuring digital skills through quantitative assessments, with limited attention given to the lived experience of individuals who develop and apply these competencies in real educational and professional contexts. In particular, there is a lack of qualitative research that simultaneously examines the perspectives of students, teachers and IT professional. This study is therefore conducted to explore digital competence as an experiential and contextual process, with the aim of informing the development of a comprehensive digital competence framework or capacity-building program that is responsive to the realities of educational institutions and workplaces.

This study is aligned with the Sustainable Development Goals (SDGs), particularly Sustainable Development Goal 4 (Quality Education), which emphasizes inclusive, equitable, and quality education while promoting lifelong learning opportunities for all. Additionally, this study supports SDG 9 (Industry, Innovation, and Infrastructure) by contributing to the understanding of digital capacity-building and the integration of technology in educational systems. By examining the lived experiences of students and teachers in developing digital competence, this research contributes to the broader global agenda of strengthening digital skills, reducing educational inequalities, and promoting sustainable and inclusive digital transformation in education.

STATEMENT OF THE PROBLEM

This study aimed to understand the digital competence across the educational settings based on the experience of students, and teachers.

Specifically, it sought to answer the following questions:

1. How do students, and teachers describe their experience in developing digital competence?
2. What challenges do they encounter in acquiring and applying digital skills?
3. How do contextual factors influence their digital competence experiences?
4. What strategies do participants employ to enhance their digital competence?
5. Based on the findings of the study, what comprehensive digital competence framework or capacity-building program may be proposed for educational institutions and workplace?

ASSUMPTIONS

The following assumptions were formulated based on the posited problem:

1. The students, and teachers possess varying levels of digital competence based on the roles, experiences and exposure to digital technologies within educational and professional settings.
2. The students, teachers and IT professionals encounter challenges in acquiring and applying digital skills.
3. The digital competence is influenced by contextual factors based on the roles, experiences and exposure to digital technologies within educational and professional settings
4. Participants are expected to employ various strategies to enhance their digital competence.
5. The findings are expected to implemented a development of a comprehensive and context-responsive digital competence framework or capacity-building program for educational institutions and workplaces.

SCOPE AND DELIMITATIONS

This study focused on understanding digital competence across educational settings based on the lived experiences of students and teachers at Aemilianum College Inc., particularly within the College of Engineering, Computer Studies, Technology, and Liberal Arts (CECTLA). It explored how participants developed digital competence, the challenges they encountered in acquiring and applying digital skills, the contextual factors that influenced their experiences, and the strategies they employed to enhance their digital competence. The participants included a purposively selected group composed of ten (10) college students and five (5) college faculty members. These participants were chosen to represent diverse academic disciplines and perspectives within the institution, providing a holistic view of digital competence across different educational roles.

The study was delimited to a qualitative exploration of participants' self-reported experiences and did not seek to measure, compare, or quantify levels of digital competence. The findings were confined to the context of Aemilianum College Inc. and, therefore, could not be generalized to other institutions, regions, or populations. Additionally, the study did not include IT professionals outside the academic setting, nor did it conduct a longitudinal analysis of digital competence development over time. The data gathered reflected the participants' perspectives during the specific period of data collection and were limited to the scope of the open-ended survey questionnaire used in the study.

GAP BRIDGED OF THE STUDY

Sailer et al., and Espinosa et al., present studies that are closely related to the present research in examining digital competence within educational settings. Sailer et al., investigated teachers' digital competence and technology integration practices, highlighting the influence of pedagogical knowledge and institutional support on instructional strategies and student engagement. Similarly, Espinosa et al., examined contextual factors affecting ICT integration in Philippine schools and emphasized the role of socio-economic conditions, technological infrastructure, and institutional support in shaping digital learning experiences. Their studies recognize that digital competence is influenced by contextual and environmental factors within educational environments. However, while Sailer et al. focused primarily on competence application in teaching and Espinosa et al. examined institutional and structural barriers to ICT integration, neither study fully explored the lived experiences of both teachers and students in developing digital competence across educational settings.

The present study addresses this gap by providing a qualitative exploration of digital competence from the perspectives of both teachers and students, emphasizing their lived experiences, perceptions, and meaning-making processes in technology-mediated learning environments. Unlike previous studies that primarily measured competence levels, examined institutional readiness, or focused on structural factors, the present research seeks to understand how digital competence is experienced and interpreted by participants within their specific educational contexts. By integrating both teacher and student perspectives and examining digital competence as a contextual and experiential phenomenon, the study contributes a deeper understanding of competence development in educational settings and provides insights that extend beyond competence measurement toward understanding the human and experiential dimensions of digital competence.

THEORETICAL FRAMEWORK

Experiential Learning Theory by Kolb (1984), emphasizing how students and teachers

develop digital competence through direct use of digital tools, reflection on their experiences and continuous adaptation of their practices. The participants narratives about first encounters with online platforms, difficulties and gradual improvement illustrate learning as a process grounded in real-life experience. Thus, digital competence is viewed as something constructed over time through experiences and reflection.

Social Constructivist Theory by Vygotsky (1978) recognizing digital competence is shaped through interaction with peers, teachers and institutional communities. Participants often learn digital skills by seeking help, collaborating and observing others in academic settings. Therefore, digital competence is understood as a socially constructed capability rather than an individual process alone.

Ecological Systems Theory by Bronfenbrenner (1979), explains how students' and teachers' digital competence is influenced by their surrounding environments such as school policies, technological infrastructure, training opportunities, and internet accessibility. The study explores how institutional support, regional conditions, and educational resources either facilitate or hinder participants' digital skill development. Participants' experiences demonstrate that competence is affected by both personal effort and external conditions. Hence, digital competence is interpreted as a product of interaction between individuals and their educational contexts.

Proposed in this study Digital Competence Experiential Framework by Delito (2026), integrates experiential learning, social interaction, and contextual influence to explain digital competence as a dynamic and evolving process. It reflects how participants develop skills through practice, collaboration, and adaptation to institutional and technological realities. The study uses this framework to organize participants' experiences, challenges, and strategies into a coherent model. Ultimately, it guides the development of a context-responsive digital competence framework or capacity-building program for educational institutions.

CONCEPTUAL FRAMEWORK

This conceptual framework illustrates how the study explores the development of digital competence across educational settings based on the lived experiences of students and teachers at Aemilianum College Inc. The framework follows the Input–Process–Output–Outcome model with a feedback mechanism to guide the interpretation of experiences and the development of a proposed digital competence framework or capacity-building program.

The Input represents the major concerns of the study drawn from the statement of the

problem. It includes the experiences of students and teachers in developing digital competence, the challenges they face in acquiring and applying digital skills, the contextual factors influencing these experiences, and the strategies they use to enhance their competence. It also covers the need to formulate a comprehensive digital competence framework or capacity-building program for educational institutions and workplaces. These elements serve as the foundation of the inquiry.

The Process refers to the qualitative methods used to analyze the inputs of the study. It involves conducting focus group discussions and interviews with selected participants, organizing the collected data, and performing thematic analysis through coding and interpretation. Validation of findings is also carried out to ensure credibility and accuracy of the results. Through this systematic process, meaningful patterns and insights about digital competence development are generated.

The Output of the study is the proposed digital competence framework derived from the analyzed data. This framework integrates participants' experiences, challenges, contextual influences, and effective strategies in developing digital skills. It serves as a guide for educational institutions in designing programs, policies, and interventions related to digital competence. The framework is intended to be practical, context-sensitive, and applicable to both academic and professional settings.

The Outcomes refer to the expected benefits of implementing the proposed digital competence framework. These include improved digital competence among students and teachers at Aemilianum College Inc., greater confidence in using digital technologies, and more effective teaching and learning practices. The study also anticipates increased institutional readiness for digital transformation. Overall, the outcomes contribute to sustainable and responsible integration of technology in education.

The Feedback component highlights the continuous improvement cycle of the framework and institutional practices. Findings from the study can be used to refine training programs, update policies, and improve digital learning strategies over time. It allows institutions to respond to emerging technological changes and evolving educational needs. This ensures that digital competence development remains relevant and sustainable.

RESEARCH FOCUS

This study focused on understanding digital competence across educational settings based on the lived experiences of students and teachers at Aemilianum College Inc. It explores how

participants develop digital competence, the challenges they encounter in acquiring and applying digital skills, the contextual factors that influence their experiences and the strategies they employ to enhance their competence. The study also aimed to generate a proposed digital competence framework or capacity-building program grounded in participants' experiences.

APPROPRIATENESS OF DESIGN

This study utilized a qualitative research design, specifically a phenomenological approach, to explore the lived experiences of students and teachers in developing digital competence. Phenomenology is appropriate for this study as it seeks to understand how individuals make meaning of their experiences regarding digital technology use in educational settings.

This design allows the researcher capture rich detailed narratives and gains deeper insights into participants' perceptions, challenges and strategies in developing digital competence. Since the study focused on experiences rather than measurement, a qualitative approach is deemed most suitable meanings and insights related to the development of digital competence. The researcher first transcribed all responses from Focus Group Discussion (FGD) and carefully reviewed the data through repeated reading to gain familiarity with the participants' narratives. Significant statements and relevant responses were then identified and coded based on their meanings.

Following the coding process, similar codes were grouped into categories, which were further organized into emerging themes that reflects the shared experiences, challenges, contextual influences and strategies described by the participants. These themes were interpreted in relation to the research questions to provide a comprehensive understanding of the phenomenon under study. The process of analysis was iterative, allowing continuous refinement of codes and themes to ensure accuracy and depth of the interpretation. This systematic approach enabled the researcher to present meaningful findings grounded in the participants lived experiences.

FINDINGS

The following findings presents the summarized results of the study:

1. Students and teachers described their experience in developing digital competence as a continuous, evolving, and experiential process. Participants emphasized that their skills improved through constant exposure to digital tools, academic requirements, and teaching practices. While some reported initial difficulties, particularly with advanced technologies, these challenges contributed to gradual improvement and confidence over time. Many participants perceived digital competence as beneficial and essential, especially in adapting to modern educational demands. Teachers, in particular, demonstrated instructional innovation, integrating digital tools creatively to enhance teaching and learning. Overall, digital competence was experienced as a dynamic process shaped by practice, adaptation, and engagement with technology.

2. Participants encountered several challenges in acquiring and applying digital skills, primarily related to connectivity, resources, and technical knowledge. Unstable and slow internet connection significantly disrupted learning and teaching activities. Additionally, limited access to devices, software, and academic resources hindered effective engagement with digital technologies. Both students and teachers also experienced technical skill gaps, especially when dealing with complex tasks such as programming and troubleshooting. Furthermore, participants faced difficulty in evaluating the credibility of online information, which affected their academic work. These challenges highlight that digital competence development is often constrained by both technical and environmental limitations.

3. Contextual factors were found to have a significant influence on the development of digital competence. Participants emphasized that institutional support, including training opportunities and administrative assistance, greatly affected their ability to develop digital skills. The availability of technological infrastructure, such as reliable internet and adequate devices, also played a crucial role in shaping their experiences. Moreover, the learning environment, including classroom practices and access to digital platforms, influenced how participants engaged with technology. These findings indicate that digital competence is not solely dependent on individual effort but is largely shaped by external conditions and institutional context.

4. Participants employed various strategies to enhance their digital competence, primarily through self-directed learning, collaboration, and continuous practice. Many relied on online resources, such as videos, tutorials, and AI tools, to improve their understanding of digital technologies. Collaboration with peers and colleagues was also a common strategy, allowing participants to seek assistance and share knowledge. Additionally, participants utilized trial-and-error approaches and hands-on practice to develop their skills. These strategies reflect an active and adaptive approach to learning, demonstrating that digital competence is strengthened through initiative, interaction, and experience.

5. Based on the findings, a comprehensive and context-responsive digital competence framework or capacity-building program is necessary to support students and teachers. The proposed framework should integrate experiential learning, social interaction, and contextual support, reflecting the actual experiences of participants. It should include

structured training programs, access to digital resources, and institutional support systems to address existing challenges. Furthermore, the program should promote continuous learning, collaboration, and the effective use of emerging technologies such as AI tools. This framework aims to enhance digital competence in a way that is practical, sustainable, and aligned with the needs of educational institutions.

CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn:

1. The development of digital competence among students and teachers is a continuous, experiential, and evolving process. It is shaped through constant interaction with digital technologies, where both challenges and opportunities contribute to skill improvement. The experiences of participants confirm that digital competence is not acquired instantly but is gradually developed through practice, adaptation, and meaningful engagement, leading to increased confidence and instructional innovation over time.

2. The acquisition and application of digital competence are significantly hindered by connectivity issues, limited resources, and technical skill gaps. These challenges demonstrate that digital competence development is not solely dependent on individual ability but is constrained by technological and environmental limitations. Furthermore, difficulties in evaluating the credibility of online information highlight the need for stronger information literacy skills among both students and teachers.

3. Digital competence is strongly influenced by contextual and institutional factors, including access to technological infrastructure, availability of digital resources, and level of institutional support. The findings indicate that a supportive learning environment plays a crucial role in facilitating or hindering digital competence development. Thus, digital competence should be understood as a product of the interaction between individual efforts and external conditions.

4. Students and teachers enhance their digital competence through active and adaptive learning strategies, such as self-directed learning, collaboration, and continuous practice. These strategies demonstrate that individuals take initiative in overcoming challenges and improving their skills. The use of digital tools, including online resources and AI technologies, further supports the development of competence, emphasizing the importance of independent learning and peer support.

5. There is a clear need for a comprehensive, context-responsive digital competence framework or capacity-building program that addresses the actual experiences and challenges of students and teachers. Such a framework should integrate experiential learning, collaboration, and institutional support to ensure effective and sustainable

development of digital competence. This conclusion affirms that structured interventions are necessary to bridge gaps and promote digital readiness in educational settings.

RECOMMENDATIONS

Based on the conclusions of the study, the following recommendations are proposed:

1. Educational institutions should design and implement continuous and experiential learning opportunities that allow students and teachers to regularly engage with digital technologies. This may include hands-on activities, project-based learning, and technology-integrated instruction to support the gradual and sustained development of digital competence.

2. Schools and administrators should address existing barriers by improving internet connectivity, access to digital devices, and availability of learning resources. In addition, training programs should be provided to help students and teachers overcome technical skill gaps and develop information literacy, particularly in evaluating the credibility of online sources.

3. Educational institutions should strengthen institutional support systems, including the provision of adequate technological infrastructure, technical assistance, and administrative support. Creating a supportive and resource-rich learning environment will enhance the ability of students and teachers to effectively develop and apply digital competence.

4. Teachers and students should be encouraged to adopt self-directed learning, collaboration, and continuous practice as key strategies for improving digital competence. Schools may facilitate this by promoting peer mentoring, collaborative learning activities, and the integration of digital tools, including AI technologies, into academic tasks.

5. Educational institutions should develop and implement a comprehensive digital competence framework or capacity-building program that is aligned with the needs of students and teachers. This program should include structured training, continuous professional development, and policies that support sustainable digital transformation in education.

DIGITAL COMPETENCE EXPERIENTIAL CAPACITY-BUILDING FRAMEWORK

Component	Description	Proposed Activities	Expected Output
1. Digital Awareness and Readiness	Develops basic understanding of digital competence, responsible technology use, and the importance of digital skills in education.	Orientation on digital competence, digital ethics, responsible AI use, and online safety.	Increased awareness of digital responsibilities and readiness to use technology.
2. Technical Skills Development	Addresses basic and advanced digital skill gaps among students and teachers.	Hands-on training on Google Workspace, Microsoft Office, LMS platforms, online submission tools, presentation tools, and basic troubleshooting.	Improved confidence and ability to use common academic digital tools.
3. Information and Media Literacy	Strengthens the ability to search, evaluate, organize, and use online information responsibly.	Workshops on credible sources, proper citation, plagiarism awareness, fact-checking, and research databases.	Improved ability to evaluate online information and use it ethically.
4. Digital Content Creation	Enhances skills in creating academic and instructional digital outputs.	Training on Canva, PowerPoint, video presentation tools, document formatting, and digital storytelling.	Better quality of academic outputs, presentations, and instructional materials.
5. AI and Emerging Technology Integration	Guides students and teachers in the responsible and productive use of AI tools.	Sessions on ChatGPT use, AI-assisted learning, prompt writing, checking AI-generated outputs, and ethical limitations of AI.	Responsible and critical use of AI for learning and teaching.
6. Collaborative Digital Learning	Promotes peer learning and teacher-student collaboration in digital environments.	Peer mentoring, group digital projects, online discussion activities, and teacher-led digital support sessions.	Stronger collaboration and shared learning among students and teachers.
7. Institutional Support and	Addresses contextual barriers such as internet access, device	Improve Wi-Fi access, provide computer	More supportive and sustainable digital

Infrastructure	availability, and technical support.	laboratory support, create helpdesk assistance, and schedule regular digital training.	learning environment.
8. Monitoring and Continuous Improvement	Ensures that the program remains responsive to changing digital needs.	Feedback forms, skills assessment, follow-up training, and annual review of digital programs.	Updated and improved digital competence initiatives.

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