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Digital Technology Utilization at Lataban National High School: Digitization Model

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ABSTRACT

This study assessed the digital technology utilization of junior high school students at Lataban National High School, Liloan, Cebu, during School Year 2025–2026 as the basis for developing a Digitization Model. Anchored in constructivist, connectivist, academic learning, and literacy-development perspectives, the study employed a descriptive-correlational research design involving 75 Grade 9 and Grade 10 students selected through total enumeration. Data were gathered using an adapted questionnaire and analyzed through frequencies, percentages, weighted means, standard deviations, and Pearson product-moment correlation. Findings revealed that respondents demonstrated very high technological skills (M = 4.24) and high levels of personal security, critical thinking, device security, informational, and communication skills. Digital tool utilization was high in online collaboration (M = 4.12), artificial intelligence in education (M = 3.96), electronic boards for learning (M = 3.42), and excessive technology use (M = 3.82). Internet resources (M = 3.50) and open-source AI tools (M = 3.42) showed high availability, while AI subscriptions (M = 3.19) and laptops (M = 3.29) demonstrated moderate availability. A significant positive relationship was established between digital technology utilization skills and digital tool utilization ($r = 0.62$, $p < 0.05$), resulting in the rejection of the null hypothesis. The study recommended strengthening digital competencies, improving technological resources, promoting responsible AI utilization, and progressively implementing the proposed Digitization Model. The research supports Sustainable Development Goal (SDG) 4 on Quality Education, SDG 9 on Industry, Innovation and Infrastructure, and SDG 10 on Reduced Inequalities. Its sustainability implications involve promoting equitable digital learning opportunities, responsible technology utilization, and evidence-based institutional improvements toward inclusive and sustainable educational digitalization.

Keywords: *Artificial Intelligence in Education, Digital Competence, Digital Literacy, Digital Technology Utilization, Digital Tool Utilization, Digitization Model, Educational Technology*

1. INTRODUCTION

Digital technology has become an important component of contemporary education, enabling learners to access information, communicate, collaborate, and complete academic activities. Digital competence involves more than operating technological devices; it includes the ability to evaluate information, communicate responsibly, solve problems, and maintain safety in digital environments (Vuorikari et al., 2022). However, the educational benefits of technology depend on its appropriate utilization, learners' competencies, available resources, and instructional practices (UNESCO, 2023; Msafiri et al., 2023). International research emphasizes the importance of strengthening students' digital literacy while addressing inequalities in technological access and competency development. The International Computer and Information Literacy Study highlighted differences in learners' digital competencies associated with socioeconomic and educational conditions (Fraillon, 2024). Similarly, the Organisation for Economic Co-operation and Development (OECD, 2023) emphasized the importance of supportive learning environments and appropriate technology utilization. In the Philippines, the Department of Education (DepEd, 2023) established revised guidelines for the DepEd Computerization Program to strengthen technological resources and digital competencies in public schools. The Quality Basic Education Development Plan 2025–2035 further identifies digitalization as a strategic priority for improving educational delivery, infrastructure, and learning opportunities (DepEd, 2025). Against this background, the present study examined the digital technology utilization of junior high school students at Lataban National High School, Liloan, Cebu, during School Year 2025–2026. Specifically, it assessed students' digital competencies, extent of digital tool utilization, and available technological resources as the basis for developing a contextualized Digitization Model.

Research Problem

Despite the increasing integration of digital technologies into education, differences remain in learners' technological competencies, access to digital resources, and ability to utilize digital tools effectively. Msafiri et al. (2023) identified technological infrastructure, resource maintenance, digital competencies, and instructional support as important considerations in integrating ICT into secondary education. UNESCO (2023) likewise emphasized that technology integration must consider educational relevance, equity, and evidence of learning benefits. Digital inequalities remain particularly important among learners from different socioeconomic backgrounds. Fraillon (2024) documented disparities in computer and information literacy, while UNICEF Innocenti (2025) highlighted relationships between children's digital access, skill development, and online experiences. Emerging technologies also introduce concerns involving artificial intelligence, information reliability, privacy, online security, and excessive technology use. Miao and Holmes (2023) emphasized the importance of human-centered and responsible AI integration, particularly in educational environments. Although these studies provide valuable evidence, school-specific assessment is necessary to determine how learners utilize available digital technologies within their actual educational contexts. Accordingly, the present study addressed the need to examine the digital technology utilization skills, digital learning practices, and technological resources of students at Lataban National High School. The findings served as the basis for developing a Digitization Model responsive to the school's identified needs.

Assumptions of the Study

The study was guided by the assumption that students' digital technology utilization may vary according to their competencies, technological access, and educational circumstances. These considerations are consistent with research emphasizing the influence of digital learning environments and available resources on learners' digital experiences (Fraillon, 2024; UNICEF Innocenti, 2025). It further assumed that students' digital technology utilization skills and extent

of digital tool utilization could be systematically assessed using an appropriately developed research instrument. The study tested the following null hypothesis at the 0.05 level of significance: H_{01}: There is no significant relationship between the respondents' level of digital technology utilization skills and their extent of digital tool utilization.

Objectives of the Study

The study generally aimed to assess the digital technology utilization of junior high school students at Lataban National High School, Liloan, Cebu, during School Year 2025–2026 as the basis for developing a Digitization Model. Specifically, it sought to determine the respondents' profiles in terms of age, gender, parents' educational attainment, parents' occupations, combined monthly family income, and digital availability; assess their digital technology utilization skills in terms of technological, personal security, critical, device security, informational, and communication skills; determine the extent of digital tool utilization concerning artificial intelligence in education, online collaboration, electronic boards for learning, and excessive technology use; evaluate the availability of school digital resources, including internet connectivity, AI subscriptions, open-source AI tools, and laptops or other internet-enabled devices; examine the significant relationship between digital technology utilization skills and the extent of digital tool utilization; and develop a Digitization Model based on the findings.

Theoretical or Conceptual Basis

The study draws on constructivist, connectivist, academic learning, and literacy-development perspectives identified in the original thesis. Collectively, these perspectives emphasize active learning, knowledge construction, learning interactions, individual competencies, and the influence of educational environments. Contemporary research on ICT integration likewise recognizes the importance of learner participation, appropriate instructional approaches, technological competencies, and supportive educational conditions (Msafiri et al., 2023). The study's contemporary conceptual framework is further informed by the Digital Competence Framework for Citizens (DigComp 2.2), which identifies information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving as essential dimensions of digital competence (Vuorikari et al., 2022). These dimensions provide relevant guidance for examining the technological, informational, critical, communication, and security-related skills included in the study. The UNESCO AI Competency Framework for Students also emphasizes responsible AI utilization, ethical awareness, human-centered decision-making, and the development of appropriate AI competencies (Miao et al., 2024). This framework supports the inclusion of artificial intelligence as an emerging dimension of students' digital learning practices. Furthermore, the study aligns with the revised DepEd Computerization Program and the Quality Basic Education Development Plan, which recognize the importance of appropriate technological infrastructure, strengthened digital competencies, and sustainable technology integration (DepEd, 2023, 2025). Conceptually, the study examines three interconnected components: students' digital technology utilization skills, extent of digital tool utilization, and availability of digital technology resources. These components provide the empirical basis for developing a school-specific Digitization Model intended to strengthen responsible, effective, and accessible technology-supported learning.

The study primarily supports SDG 4 – Quality Education, particularly the development of relevant digital competencies and the promotion of equitable learning opportunities. By assessing students' digital skills and technology utilization, the research provides information that may guide interventions for strengthening inclusive and technology-supported education (United Nations, 2025; UNESCO, 2023). The study also contributes to SDG 9 – Industry, Innovation and Infrastructure by examining the availability of internet connectivity, digital devices, and other

technological resources necessary for effective educational digitalization. Identifying resource needs may support school-level infrastructure planning and responsible technological innovation (DepEd, 2025). Furthermore, it is relevant to SDG 10 – Reduced Inequalities, as examining students' socioeconomic characteristics and access to digital resources can help identify potential disparities in digital learning opportunities. Such information may inform more equitable resource allocation and learner-support strategies (Fraillon, 2024; UNICEF Innocenti, 2025). Overall, the proposed Digitization Model may contribute to educational, technological, socio-economic, and institutional sustainability by supporting evidence-based improvements in digital competencies, responsible technology utilization, and equitable access to digital learning resources.

2. METHODOLOGY

Research Design

The study utilized a descriptive-correlational research design. The descriptive component examined respondents' demographic profiles, digital technology utilization skills, extent of digital tool utilization, and available technological resources. The correlational component determined the relationship between digital technology utilization skills and the extent of digital tool utilization without manipulating the study variables. The findings provided empirical inputs for developing a Digitization Model intended to improve digital learning practices and technology integration.

Research Locale or Study Setting

The study was conducted at Lataban National High School in Lataban, Liloan, Cebu, Philippines, during School Year 2025–2026. The school provided an appropriate setting for examining students' digital competencies and utilization of technological resources in ICT-related learning activities. Its educational environment allowed the systematic administration of research instruments in coordination with school administrators and ICT teachers.

Participants or Data Sources

The study involved 75 junior high school students enrolled in ICT-related subjects, comprising 38 Grade 9 students (50.66%) and 37 Grade 10 students (49.33%). The methodology identified total enumeration sampling as the approach used to include eligible students directly exposed to ICT-related learning activities. Their responses provided information on demographic characteristics, digital competencies, technology utilization practices, and available digital learning resources.

Research Instruments or Materials

Data were collected using an adapted research-based questionnaire drawn from the studies of Cancer et al. (2025) and de-Dios et al. (2016). The instrument consisted of four components. The first assessed respondents' age, gender, parents' educational attainment, parental occupations, combined monthly family income, and digital availability. The second measured technological, personal security, critical thinking, device security, informational, and communication skills, with five items for each dimension. The third examined the extent of digital tool utilization, including artificial intelligence in education, online collaboration, electronic boards for learning, and excessive technology use. The fourth assessed available school resources, including internet connectivity, AI subscriptions, open-source AI tools, and laptops or other internet-enabled devices.

Data Gathering Procedure

Before data collection, the researcher submitted a formal request to the school principal or district supervisor to obtain permission to conduct the study. Upon approval, the researcher

coordinated with school personnel to schedule questionnaire administration. Respondents attended an orientation explaining the study's objectives, procedures, and confidentiality measures. Written and verbal instructions were provided during questionnaire administration, and assistance was extended when necessary. After collection, the completed questionnaires were compiled, organized, and prepared for statistical analysis and interpretation.

Data Analysis

The collected data were analyzed using frequencies, percentages, weighted means, standard deviations, and Pearson product-moment correlation. Frequencies and percentages described respondents' demographic profiles, while weighted means determined their digital technology utilization skills, extent of digital tool utilization, and availability of technological resources. Standard deviations measured the variability of responses. Pearson correlation was used to determine the strength and direction of the relationship between digital technology utilization skills and digital tool utilization, with statistical significance tested at the 0.05 level. A five-point Likert scale was employed to interpret responses. Mean scores ranging from 4.21 to 5.00 indicated very high extent; 3.41 to 4.20, high extent; 2.61 to 3.40, moderate extent; 1.81 to 2.60, low extent; and 1.00 to 1.80, very low extent. The statistical findings provided the empirical basis for the proposed Digitization Model.

Ethical Consideration

The study observed ethical principles involving voluntary participation, informed consent, anonymity, confidentiality, and accurate reporting of findings. Respondents were informed of the research objectives, procedures, and their rights before participating. Participation was voluntary, and respondents were assured that their personal information and responses would remain confidential. The researcher maintained the privacy of collected data and ensured the accurate, objective, and original presentation of research findings.

3. RESULTS AND DISCUSSION

3.1 Demographic Profile of the Respondents

3.1.1 Age

The findings revealed that most respondents were 17 years old (26.67%), followed by those aged 16 (24.00%) and 18 (22.67%). Students aged 15 and 19 each accounted for 10.67%, while those aged 20 and above represented 5.32%. These results indicate that the respondents predominantly belonged to the adolescent age group. The age distribution suggests that respondents were at a developmental stage characterized by increasing exposure to digital learning environments. Senkbeil (2023) emphasized that adolescents' digital competencies are influenced by their home learning environments and opportunities to use technology. Similarly, Cheah et al. (2024) highlighted the feasibility of technology-supported learning among Filipino learners and families.

3.1.2 Gender

The respondents comprised 42 males (56.00%) and 33 females (44.00%), indicating a slightly higher representation of male learners. Both groups were represented in the assessment of digital technology utilization. The distribution provided opportunities to examine digital learning experiences among male and female students. Yousofi et al. (2025) emphasized that digital equity involves technological access, digital literacy, and educational conditions, although their findings showed no significant relationship between digital equity and educational outcomes.

3.1.3 Parents' Educational Attainment

The findings showed that 26.67% of respondents' parents were high school graduates, followed by bachelor's degree holders (21.32%), college-level education (18.67%), high school level (16.00%), elementary graduates (10.67%), and elementary-level education (6.67%). These results reflected varied parental educational backgrounds. Differences in parental education may influence learners' access to academic guidance and support for technology-assisted learning. Senkbeil (2023) found that parental ICT practices and values were associated with children's digital literacy development. Similarly, Ruiz et al. (2024) emphasized the relevance of parental education, technological literacy, and family guidance to adolescents' learning experiences.

3.1.4 Parents' Occupations

The results indicated that 36.00% of respondents' parents had permanent employment, 28.00% reported no occupation, 25.33% had contractual employment, and 10.67% belonged to other occupational categories. Permanent employment represented the largest group. The findings suggest differences in household employment conditions that may affect the availability of educational and technological resources. Chen (2025) identified socioeconomic status as an important factor influencing digital technology use and competency development. Likewise, Ajani (2025) emphasized that socioeconomic and infrastructural conditions influence students' experiences with digital learning systems.

3.1.5 Combined Monthly Family Income

The findings revealed that 46.67% of respondents belonged to households earning below ₱10,000 monthly, followed by those earning ₱10,001–₱15,000 (33.33%) and ₱15,001–₱20,000 (20.00%). The results indicated that most respondents came from relatively low-income households within the study's income categories. Household income may influence students' access to digital devices, internet connectivity, and educational resources. Cañete et al. (2023) identified family income as an important determinant of digital capital among Filipino students. Similarly, Chen (2025) emphasized that socioeconomic conditions influence students' digital engagement and competency development.

3.1.6 Digital Availability

The findings showed that 63 respondents (84.00%) reported having access to digital technology, while 12 (16.00%) indicated no digital availability. Although most respondents had access to technological resources, a smaller proportion continued to experience access limitations. The results suggest that digital access was generally available but not equally distributed among respondents. Chen (2025) emphasized that digital inequality extends beyond access to technological devices and includes differences in digital competencies and utilization. Similarly, Yousofi et al. (2025) identified limitations in institutional technological resources despite students' access to personal devices.

3.2 Level of Digital Technology Utilization Skills

3.2.1 Technological Skills

The respondents demonstrated a very high level of technological skills, with an overall weighted mean of 4.24. Downloading and saving online photographs obtained the highest mean of 4.42, followed by downloading information (4.38). Using keyboard shortcuts received the lowest mean of 4.06, although it remained within the high-extent category. The findings indicate that respondents were highly competent in performing basic technological tasks necessary for academic activities. Mejías-Acosta et al. (2024) emphasized the importance of assessing practical digital competencies, while Chaw and Tang (2024) identified information retrieval, communication, collaboration, and problem-solving as essential digital skills. Cepa-Rodríguez and Etxeberria Murgiondo (2024) similarly highlighted practical technological competence in

educational activities, while Song et al. (2025) recognized digital learning competence as an important learner competency.

3.2.2 Personal Security Skills

The respondents obtained an overall weighted mean of 4.09, indicating a high level of personal security skills. Knowledge of appropriate online posting of other people's photographs and videos received the highest mean of 4.21, while deactivating geographical location-sharing features obtained the lowest mean of 3.92. The findings suggest that respondents possessed considerable awareness of privacy protection, responsible information sharing, and appropriate online behavior. Saritepeci (2024) emphasized the relationship between digital literacy and privacy awareness, while Canada et al. (2025) highlighted risks involving data loss and account security. Choi and Park (2023) and Lu and Gu (2025) further identified digital citizenship, internet skills, and self-efficacy as important factors in responsible online participation.

3.2.3 Critical Skills

The respondents demonstrated a high level of critical digital skills, obtaining an overall weighted mean of 4.04. Determining the reliability of online information received the highest recorded mean of 4.18, followed by comparing information from different sources (4.12). Identifying authentic online profiles obtained the lowest mean of 3.91. The findings indicate that respondents generally possessed the ability to evaluate digital information, although further development of information verification skills remained relevant. Fajardo (2023) emphasized the importance of fact-checking and credibility assessment among Filipino students. Similarly, Marten and Stadtler (2025) highlighted the effectiveness of instruction in evaluating online sources, while Merga and Roni (2025) underscored the importance of strengthening digital information literacy.

3.2.4 Device Security Skills

The respondents obtained an overall weighted mean of 4.03, indicating a high level of device security skills. Identifying suspicious links or potentially harmful files obtained the highest mean of 4.21, while detecting viruses in digital devices received the lowest mean of 3.88. The findings indicate that respondents generally recognized common cybersecurity threats and practiced basic device protection. Alves-Foss and Llego (2024) emphasized the importance of cybersecurity awareness among Filipino students, while Adeshola and Oluwajana (2024) highlighted the need for educational interventions that strengthen security knowledge. Similarly, Lui et al. (2025) demonstrated the value of structured cybersecurity education in improving students' awareness and protective practices.

3.2.5 Informational Skills

The respondents demonstrated a high level of informational skills, with an overall weighted mean of 3.45. The recoded item concerning difficulties understanding website designs received the highest mean of 3.61, followed by selecting appropriate search keywords (3.52). Unplanned navigation to unfamiliar websites received the lowest mean of 3.29. The findings highlight the importance of strengthening students' information-searching and website navigation competencies. Han et al. (2025) emphasized the relevance of effective navigation strategies in digital reading, while Akter and Ahmed (2024) identified information-literacy training as beneficial for utilizing online resources. Ramos and Abella (2024) and Galagala and Bacarrisas (2025) likewise emphasized students' abilities to search, evaluate, and manage digital information while addressing misinformation and unreliable content.

3.2.6 Communication Skills

The respondents obtained an overall weighted mean of 4.09, indicating a high level of digital communication skills. Sending files through smartphones received the highest mean of 4.36,

while using emojis in digital communication obtained the lowest mean of 3.74. The findings indicate that respondents were proficient in exchanging information and communicating through digital platforms. Getenet et al. (2024) emphasized the contribution of digital literacy to online engagement and collaboration, while Pasatiempo et al. (2025) highlighted the role of mobile-assisted learning in developing communication competencies. Similarly, Acala and Dimasacat (2023) and Boonchuvong et al. (2024) identified learning management systems and mobile applications as useful platforms for academic communication and collaboration.

3.3 Extent of Digital Tool Utilization

3.3.1 Artificial Intelligence in Education

The findings revealed a high extent of AI utilization in education, with an overall weighted mean of 3.96. AI-generated immediate feedback for correcting learning mistakes received the highest mean of 4.11, followed by personalized learning opportunities (4.08). Using AI-based tools for grading or assignment feedback obtained the lowest mean of 3.72. The results indicate that respondents recognized AI as a useful educational tool, particularly for feedback, learning assistance, and personalized learning. Liu et al. (2025) reported positive effects of generative AI on learning achievement and motivation, while Bai and Wang (2025) emphasized the importance of effective AI interactions. Similarly, Chen and Cheung (2025) and Han et al. (2025) highlighted the potential contribution of generative AI to learning outcomes, engagement, and self-regulated learning.

3.3.2 Online Collaboration

The respondents demonstrated a high extent of online collaboration, obtaining an overall weighted mean of 4.12. Comfort in collaborating with classmates online received the highest mean of 4.18, followed by ease of communication and sharing ideas (4.14). Learning from diverse perspectives obtained the lowest mean of 4.06. The findings suggest that respondents were generally comfortable participating in technology-supported collaborative learning. Bach and Thiel (2024) emphasized the importance of meaningful digital interaction and organized collaborative activities. Ateş and Köroğlu (2024) identified improvements in learning outcomes and engagement through online collaboration, while Tian and Zheng (2024) reported positive effects of online collaborative problem-solving on learning performance.

3.3.3 Use of Electronic Boards for Learning

The findings indicated a high overall extent for the electronic-board learning indicators, with a weighted mean of 3.42. The perception that printed books support better memorization obtained the highest mean of 3.56, followed by better comprehension using printed materials (3.45). Difficulty remembering information from physical books compared with electronic boards received the lowest mean of 3.28. The results indicate that respondents recognized the relevance of digital learning materials while expressing preferences for printed materials in certain learning activities. Hare et al. (2024) reported differences in reading outcomes between printed and digital formats, while Abellanoza et al. (2025) identified a modest comprehension advantage associated with printed materials. Meanwhile, Liu et al. (2026) emphasized the potential of AI-enhanced collaborative whiteboards to support student engagement and learning performance.

3.3.4 Excessive Use of Technology

The respondents demonstrated a high extent of excessive technology use, obtaining an overall weighted mean of 3.82. The belief that reducing screen time could improve academic performance received the highest mean of 4.01, followed by frequently checking smartphones during study sessions (3.86). Using devices for nonacademic purposes during study time obtained the lowest mean of 3.68. The findings indicate that respondents recognized the possibility that excessive technology use could interfere with academic activities. Wang et al.

(2024) reported an association between prolonged digital-device use and lower academic performance, particularly when technology was used for noneducational purposes. Similarly, Paterna et al. (2024) identified a negative relationship between problematic smartphone use and academic performance, emphasizing the importance of responsible screen-time management.

3.4 Availability of Digital Technology Resources

3.4.1 Internet Resources

The respondents rated the availability of school internet resources at a high extent, with an overall weighted mean of 3.50. Access to educational websites and online learning platforms received the highest mean of 3.62, followed by reliable internet connectivity (3.58). Adequacy of internet bandwidth obtained the lowest mean of 3.39, indicating moderate availability. The findings suggest that internet connectivity generally supported digital learning activities, although bandwidth remained an area requiring improvement. Rosales (2024) emphasized the importance of access to electronic educational resources, while Alampay and Capule-Navarro (2023) highlighted continuing connectivity disparities in Philippine public schools. Ferido (2026) further emphasized connectivity improvements in underserved schools, while Akmad and Abatayo (2024) identified unstable internet access as a barrier to academic participation and digital collaboration.

3.4.2 AI Subscriptions

The availability of school-supported AI subscriptions obtained an overall weighted mean of 3.19, indicating a moderate extent. Guidance on responsible AI utilization received the highest mean of 3.34, while maintaining active subscriptions to AI platforms obtained the lowest mean of 3.05. The results indicate that AI subscription resources were available but limited, suggesting a need for stronger institutional support and guidance on responsible AI use. Chiu et al. (2024) emphasized ethical awareness and AI competency development in basic education. Similarly, Jeilani and Abubakar (2025) highlighted the importance of institutional support in AI-assisted learning, while Gao et al. (2025) emphasized access to AI resources, technical assistance, professional development, and institutional readiness.

3.4.3 Access to Open-Source AI

The availability of open-source AI tools obtained an overall weighted mean of 3.42, indicating a high extent. Teachers' access to open-source AI tools for instructional preparation received the highest mean of 3.55, followed by students' access to these tools for learning activities (3.48). Providing information about available open-source AI tools obtained the lowest mean of 3.29. The findings suggest that open-source AI technologies provided accessible resources for teaching and learning. Lin (2026) emphasized the transparency, adaptability, and flexibility of open-source AI models, while Kohnke and Zou (2025) highlighted the importance of teachers' technological and pedagogical preparation. Similarly, Xu et al. (2025) identified professional development as an important factor in strengthening teachers' AI competencies and instructional integration.

3.4.4 Availability of Laptops

The respondents rated the availability of school laptops at a moderate extent, with an overall weighted mean of 3.29. Laptop functionality and suitability for learning obtained the highest mean of 3.46, while the sufficiency of available laptops received the lowest mean of 3.12. The findings indicate that available laptops were generally functional but insufficient to fully support students' digital learning requirements. Loh et al. (2025) emphasized the importance of adequate ICT infrastructure and technical resources in developing digital competencies. Similarly, Arante and Bascon (2025) highlighted the need to improve technological resource availability and quality to strengthen digital learning environments.

3.5 Relationship Between Digital Technology Utilization Skills and Digital Tool Utilization

The results revealed a statistically significant positive relationship between digital technology utilization skills and the extent of digital tool utilization, with a Pearson correlation coefficient of 0.62, a t-value of 6.72, and a reported p-value of 0.000. Since the p-value was below the 0.05 significance level, the null hypothesis was rejected. The findings indicate that respondents with higher digital technology utilization skills also tended to report greater digital tool utilization. The findings demonstrate the importance of digital competencies in students' engagement with technology-supported learning. Fütterer et al. (2024) identified a positive relationship between technology-use frequency and students' digital learning competencies. Similarly, Chan and Sung (2026) emphasized that meaningful engagement with digital tools supports the development and application of digital literacy skills in academic activities. The significant association identified in the present study supports the relevance of strengthening technological, informational, critical, security, and communication competencies alongside effective digital tool utilization.

3.6 Proposed Digitization Model

Based on the findings, the study proposed a Digitization Model comprising three interconnected components: Digital Technology Utilization Skills, Digital Tool Utilization, and Digital Technology Resources Available. The model addresses the identified need to strengthen students' technological competencies, promote appropriate utilization of AI and other digital learning tools, and improve access to school technological resources. It serves as a proposed framework for developing school-level interventions responsive to the assessment results. The proposed model is consistent with research emphasizing the importance of digital competence, technology integration, and institutional resources. Tan et al. (2024), Nuezca et al. (2024), and Hu et al. (2024) highlighted the relevance of digital learning competencies and students' readiness for technology-supported education. Villanueva and Cuenca (2025) and Li et al. (2025) further emphasized digital literacy and effective technology integration, while Cabasan (2024) and Ortega-Dela Cruz and Dela Cruz (2025) identified resource disparities, infrastructure limitations, and AI-related challenges as important considerations in educational digitalization.

4. CONCLUSIONS AND RECOMMENDATIONS

The study concluded that junior high school students at Lataban National High School demonstrated generally high digital technology utilization skills and extensive use of digital tools for educational purposes. Respondents exhibited very high technological skills and high levels of personal security, critical thinking, device security, informational, and communication skills. Digital tool utilization was also high, particularly in artificial intelligence, online collaboration, and electronic boards, although excessive technology use remained a concern. Internet resources and open-source AI tools were highly available, while AI subscriptions and laptops showed moderate availability. Furthermore, a significant positive relationship was established between students' digital technology utilization skills and their extent of digital tool utilization, resulting in the rejection of the null hypothesis. These findings provided the basis for the proposed Digitization Model.

The study recommends that the Department of Education strengthen digital education initiatives and promote equitable access to technological infrastructure. School administrators should improve internet connectivity, maintain adequate digital resources, and establish guidelines for responsible AI utilization, while teachers should integrate appropriate digital tools and collaborative learning platforms into instruction. Parents and communities are encouraged to support responsible technology use and digital learning opportunities, while learners should continuously enhance their digital literacy, information evaluation, cybersecurity awareness,

and communication skills. The researcher should disseminate the findings and conduct further studies involving additional schools, respondents, and variables. Moreover, the school is encouraged to progressively adopt and implement the proposed Digitization Model, with regular evaluation to determine its effectiveness and identify areas for improvement.

The study involved 75 junior high school students from Lataban National High School during School Year 2025–2026, with findings focused on their digital technology utilization skills, digital learning practices, and available technological resources. Although the original manuscript did not explicitly identify methodological limitations, the investigation was confined to one school setting. Further studies involving other schools, larger respondent groups, and additional variables were recommended to extend the examination of digital technology utilization and learning practices.

5. REFERENCES

Abellanoza, B. V., Ilagan, S. U. X., Llanes, A. M., Amano, P., Castillo, K., Balantac, D. B., Ariola, M. J., Mangubat, A. K. M., Serafica, J., & Muria, N. (2025). Effects of digital and printed materials on reading comprehension among college students in Lipa City. *Psychology and Education: A Multidisciplinary Journal, 34*(8), 978–992. https://doi.org/10.70838/pemj.340807

Acala, J. J., & Dimasacat, A. C. B. (2023). Perceptions on the utilization of learning management system and its effects on the communication skills of private senior high school students in Manila. *Asian Journal of Education and Social Studies, 47*(3), 12–27. https://doi.org/10.9734/ajess/2023/v47i31024

Adeshola, I., & Oluwajana, D. I. (2025). Assessing cybersecurity awareness among university students: Implications for educational interventions. *Journal of Computers in Education, 12*(4), 1283–1305. https://doi.org/10.1007/s40692-024-00346-7

Ajani, O. A. (2025). Bridging the digital divide: Exploring undergraduate students' experiences with learning management systems in a rural South African university. *Frontiers in Education, 10*, Article 1674885. https://doi.org/10.3389/feduc.2025.1674885

Akmad, A. P., & Abatayo, A. V. L. (2024). Caught in the slow lane: Effects of unstable internet connectivity on accessing academic resources and collaborative learning. *Journal of Interdisciplinary Perspectives, 2*(9), 278–286. https://doi.org/10.69569/jip.2024.0370

Akter, T., & Ahmed, S. M. Z. (2024). University students' information literacy skills and impact of training in Bangladesh. *IFLA Journal, 50*(3), 620–632. https://doi.org/10.1177/03400352241266181

Alampay, E. A., & Capule-Navarro, M. T. (2023). Provision of electricity and internet access in DepEd schools: Implications on school performance and digital inclusivity in the new normal. *Philippine Journal of Public Policy: Interdisciplinary Development Perspectives, 2023*, 35–63. https://cids.up.edu.ph/wp-content/uploads/2023/12/02_Provision_Electricity_Internet_Access_DepEd_Schools_School_Performance_Digital_Inclusivity_Alampay_Navarro.pdf

Alves-Foss, J., & Llego, B. G. (2024). Internet security and privacy awareness among college students in the Philippines. In *2024 IEEE Cyber Science and Technology Congress (CyberSciTech)* (pp. 132–137). IEEE. https://doi.org/10.1109/CyberSciTech64112.2024.00030

Arante, R. B., & Bascon, D. J. (2025). Adequacy and functionality of information and communication technology infrastructure: Its online learning implications. *Journal of Education and Learning (EduLearn), 19*(3). https://doi.org/10.11591/edulearn.v19i3.22336

Ateş, H., & Köroğlu, M. (2024). Online collaborative tools for science education: Boosting learning outcomes, motivation, and engagement. *Journal of Computer Assisted Learning, 40*(3), 1052–1067. https://doi.org/10.1111/jcal.12931

Bach, A., & Thiel, F. (2024). Collaborative online learning in higher education—Quality of digital interaction and associations with individual and group-related factors. *Frontiers in Education, 9*, Article 1356271. https://doi.org/10.3389/feduc.2024.1356271

Bai, Y., & Wang, S. (2025). Impact of generative AI interaction and output quality on university students' learning outcomes: A technology-mediated and motivation-driven approach. *Scientific Reports, 15*, Article 24054. https://doi.org/10.1038/s41598-025-08697-6

Boonchuvong, C., Koraneekij, P., & Khlaisang, J. (2024). The needs assessment for the development of mobile technology supported inquiry-based collaborative learning with gamification to enhance digital information literacy and learning engagement of undergraduate students. *Journal of Information and Learning, 35*(3), 133–142. https://so04.tci-thaijo.org/index.php/jil/article/view/276225

Cabasan, R. A. A. (2024). Effective technology integration: Closing the digital gap among high school students. *Journal of Interdisciplinary Perspectives, 2*(8). https://ejournals.ph/article.php?id=24131

Cepa-Rodríguez, E., & Etxeberria Murgiondo, J. (2024). Digital competence among 1st and 4th year primary education undergraduate students: A comparative study of face-to-face and on-line teaching. *Education and Information Technologies, 29*, 24881–24898. https://doi.org/10.1007/s10639-024-12828-3

Chan, A. Y. W., & Sung, C. C. M. (2026). Enhancing students' digital literacy skills through their technology use in a course-based research project: A Hong Kong case study. *Asia Pacific Education Review, 27*, 843–856. https://doi.org/10.1007/s12564-025-10038-1

Chaw, L. Y., & Tang, C. M. (2024). Exploring the relationship between digital competence proficiency and student learning performance. *European Journal of Education, 59*(1), Article e12593. https://doi.org/10.1111/ejed.12593

Cheah, Z. R. E., McBride, C., Dulay, K. M., Cheung, S. K., Reyes, P., & Dillenbourg, P. (2024). Effects of online parent coaching on Filipino children's skills. *Early Childhood Research Quarterly, 68*, 191–202. https://doi.org/10.1016/j.ecresq.2024.05.006

Chen, S., & Cheung, A. C. K. (2025). Effect of generative artificial intelligence on university students learning outcomes: A systematic review and meta-analysis. *Educational Research Review, 49*, Article 100737. https://doi.org/10.1016/j.edurev.2025.100737

Chiu, T. K. F., Ahmad, Z., Ismailov, M., & Sanusi, I. T. (2024). What are artificial intelligence literacy and competency? A comprehensive framework to support them. *Computers and Education Open, 6*, Article 100171. https://doi.org/10.1016/j.caeo.2024.100171

Choi, M., & Park, H.-J. (2023). Korean adolescents' profiles of digital citizenship and its relations to internet ethics: Implications for critical digital citizenship education. *Cambridge Journal of Education, 53*(4), 567–586. https://doi.org/10.1080/0305764X.2023.2191929

Department of Education. (2023). *Revised guidelines on the implementation of the Department of Education Computerization Program (DepEd Order No. 016, s. 2023)*. https://www.deped.gov.ph/wp-content/uploads/DO_s2023_016.pdf

Department of Education. (2025). *Quality basic education development plan 2025–2035: An implementation strategy for the 5-point education reform agenda*. https://www.deped.gov.ph/wp-content/uploads/Quality-Basic-Education-Development-Plan-QBEDP-2025-to-2035-29-July-2025.pdf

Fajardo, M. F. (2023). Filipino students' competency in evaluating digital media content credibility: "Beginning" to "emerging" levels. *Journal of Media Literacy Education, 15*(2), 58–70. https://doi.org/10.23860/JMLE-2023-15-2-5

Ferido, M. B. (2026, June 18). *Policy pulse: Baseline study of internet connectivity for last-mile schools in the COVID-19 project: Quality assurance and data management processes*. UP Center for Integrative and Development Studies. https://cids.up.edu.ph/baseline-study-internet-connectivity-last-mile-schools-covid-19-project-quality-assurance-data-management-processes/

Fraillon, J. (Ed.). (2024). *An international perspective on digital literacy: Results from ICILS 2023*. International Association for the Evaluation of Educational Achievement. https://www.iea.nl/publications/icils-2023-international-report

Galagala, M. R. G., & Bacarrisas, H. P. (2025). Higher education students' information literacy skills in engaging with AI-generated content. *International Journal of Advanced and Applied Sciences, 12*(12), 1–8. https://doi.org/10.21833/ijaas.2025.12.001

Getenet, S., Cantle, R., Redmond, P., & Albion, P. (2024). Students' digital technology attitude, literacy and self-efficacy and their effect on online learning engagement. *International Journal of Educational Technology in Higher Education, 21*, Article 3. https://doi.org/10.1186/s41239-023-00437-y

Han, X., Peng, H., & Liu, M. (2025). The impact of GenAI on learning outcomes: A systematic review and meta-analysis of experimental studies. *Educational Research Review, 48*, Article 100714. https://doi.org/10.1016/j.edurev.2025.100714

Hare, C., Johnson, B., Vlahiotis, M., Panda, E. J., Tekok-Kilic, A., & Curtin, S. (2024). Children's reading outcomes in digital and print mediums: A systematic review. *Journal of Research in Reading, 47*(3), 309–329. https://doi.org/10.1111/1467-9817.12461

Jeilani, A., & Abubakar, S. (2025). Perceived institutional support and its effects on student perceptions of AI learning in higher education: The role of mediating perceived learning outcomes and moderating technology self-efficacy. *Frontiers in Education, 10*, Article 1548900. https://doi.org/10.3389/feduc.2025.1548900

Kohnke, L., Zou, D., Ou, A. W., & Gu, M. M. (2025). Preparing future educators for AI-enhanced classrooms: Insights into AI literacy and integration. *Computers and Education: Artificial Intelligence, 8*, Article 100398. https://doi.org/10.1016/j.caeai.2025.100398

Li, F., Cheng, L., Wang, X., Shen, L., Ma, Y., & Islam, A. Y. M. A. (2025). The causal relationship between digital literacy and students' academic achievement: A meta-analysis. *Humanities and Social Sciences Communications, 12*, Article 108. https://doi.org/10.1057/s41599-025-04399-6

Lin, M. P.-C., Huang, J.-Y., Chang, D. H., Tembrevilla, G., Bowen, G. M., Poitras, E., Janarthanan, V., & Ryoo, J. (2026). Open-source large language models in education: A narrative review of evidence, pedagogical roles, and learning outcomes. *AI Education, 2*(1), Article 4. https://doi.org/10.3390/aieduc2010004

Liu, X., Guo, B., He, W., & Hu, X. (2025). Effects of generative artificial intelligence on K-12 and higher education students' learning outcomes: A meta-analysis. *Journal of Educational Computing Research, 63*(5), 1249–1291. https://doi.org/10.1177/07356331251329185

Liu, Y.-L. E., Lee, T.-P., & Huang, Y.-M. (2026). Enhancing student engagement and higher-order thinking in human-centred design projects: The impact of generative AI-enhanced collaborative whiteboards. *Interactive Learning Environments, 34*(1), 258–275. https://doi.org/10.1080/10494820.2025.2496973

Loh, R. S. M., Kraaykamp, G., & van Hek, M. (2025). Plugging in at school: Do schools nurture digital skills and narrow digital skills inequality? *Computers & Education, 226*, Article 105195. https://doi.org/10.1016/j.compedu.2024.105195

Lu, C., & Gu, M. M. (2025). A systematic review and meta-analysis of factors and outcomes of digital citizenship among adolescents. *Asia Pacific Journal of Education, 45*(4), 1130–1145. https://doi.org/10.1080/02188791.2023.2296352

Lui, A., Womack, C., & Orton, P. (2025). Collaborative online international learning as a third space to improve students' awareness of cybersecurity. *Education and Information Technologies, 30*, 13835–13856. https://doi.org/10.1007/s10639-025-13336-8

Marten, P. L., & Stadtler, M. (2025). Building resilience against online misinformation: A teacher-led training promoting evaluation strategies among lower secondary students. *Computers in Human Behavior, 165*, Article 108548. https://doi.org/10.1016/j.chb.2024.108548

Mejías-Acosta, A., D'Armas Regnault, M., Vargas-Cano, E., Cárdenas-Cobo, J., & Vidal-Silva, C. (2024). Assessment of digital competencies in higher education students: Development and validation of a measurement scale. *Frontiers in Education, 9*, Article 1497376. https://doi.org/10.3389/feduc.2024.1497376

Merga, M. K., & Mat Roni, S. (2025). School library professionals' perceptions of students' digital information literacy. *Journal of Library Administration, 65*(4), 397–411. https://doi.org/10.1080/01930826.2025.2475701

Miao, F., & Holmes, W. (2023). *Guidance for generative AI in education and research*. UNESCO. https://doi.org/10.54675/EWZM9535

Miao, F., Shiohira, K., & Lao, N. (2024). *AI competency framework for students*. UNESCO. https://doi.org/10.54675/JKJB9835

Msafiri, M. M., Kangwa, D., & Cai, L. (2023). A systematic literature review of ICT integration in secondary education: What works, what does not, and what next? *Discover Education, 2*, Article 44. https://doi.org/10.1007/s44217-023-00070-x

Nuezca, A. P., Tangcawan, I. S. L. A., & Dequinan, T. K. (2024). Students' digital literacy competence, attitude, and readiness toward technology-integrated learning. In *Proceedings of the 4th International Conference on Education and Technology (ICETECH 2023)* (pp. 300–309). Atlantis Press. https://doi.org/10.2991/978-94-6463-554-6_23

Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results (Volume II): Learning during—and from—disruption*. OECD Publishing. https://doi.org/10.1787/a97db61c-en

Ortega-Dela Cruz, R. A., & Dela Cruz, R. Z. (2025). AI integration in IT education: Challenges, opportunities, and future directions. *Journal of Teaching and Learning, 19*(4), 6–19. https://eric.ed.gov/?id=EJ1487116

Pasatiempo, A. E., Napalit, L. V. G., Gubalane, M. T., & Quinco-Cadosales, M. N. (2025). Students' digital trajectories in improving communicative competence through mobile-assisted language learning: A meta-synthesis. *International Journal of Research and Scientific Innovation, 9*(11), 6887–6902. https://doi.org/10.47772/IJRISS.2025.91100537

Paterna, A., Alcaraz-Ibáñez, M., Aguilar-Parra, J. M., Salavera, C., Demetrovics, Z., & Griffiths, M. D. (2024). Problematic smartphone use and academic achievement: A systematic review and meta-analysis. *Journal of Behavioral Addictions, 13*(2), 313–326. https://doi.org/10.1556/2006.2024.00014

Philippine Digital Workforce Competitiveness Act, Republic Act No. 11927 (2022). https://issuances-library.senate.gov.ph/legislative%2Bissuances/Republic%20Act%20No.%2011927

Ramos, H. L. P., & Abella, C. R. G. (2024). Information literacy of BTLED students in a state university. *SARIRIT: The University Research Journal, 13*(1). https://ejournals.ph/article.php?id=30616

Rosales, A. C. (2024). An empirical study on knowledge, access and utilization of electronic resources by university students in Philippines. *International Journal of Research and Innovation in Social Science, 8*(5), 23–42. https://doi.org/10.47772/IJRISS.2024.805003

Saritepeci, M., Yildiz Durak, H., Özüdoğru, G., & Atman Uslu, N. (2024). The role of digital literacy and digital data security awareness in online privacy concerns: A multi-group analysis with gender. *Online Information Review, 48*(5), 983–1001. https://doi.org/10.1108/OIR-03-2023-0122

Senkbeil, M. (2023). How well does the digital home learning environment predict ICT literacy and ICT self-efficacy? Comparing the predictive power of adolescent and parent reports. *Computers & Education, 207*, Article 104937. https://doi.org/10.1016/j.compedu.2023.104937

Song, Y., Lv, S., Wang, M., Wang, Z., & Dong, W. (2025). The impact of digital learning competence on the academic achievement of undergraduate students. *Behavioral Sciences, 15*(7), Article 840. https://doi.org/10.3390/bs15070840

Tan, X., Lin, X., & Zhuang, R. (2024). Development and validation of a secondary vocational school students' digital learning competence scale. *Smart Learning Environments, 11*, Article 37. https://doi.org/10.1186/s40561-024-00325-6

Tian, Q., & Zheng, X. (2024). Effectiveness of online collaborative problem-solving method on students' learning performance: A meta-analysis. *Journal of Computer Assisted Learning, 40*(1), 326–341. https://doi.org/10.1111/jcal.12884

UNESCO. (2023). *Global education monitoring report 2023: Technology in education—A tool on whose terms?* https://doi.org/10.54676/UZQV8501

UNICEF Innocenti. (2025). *Childhood in a digital world*. UNICEF. https://www.unicef.org/innocenti/reports/childhood-digital-world

United Nations. (2025). *The sustainable development goals report 2025*. https://unstats.un.org/sdgs/report/2025/

Villanueva, P., & Cuenca, Z. (2025). Integration of contemporary teaching and digital literacy among Grade 12 ICT students. *Psychology and Education: A Multidisciplinary Journal, 46*(2), 143–155. https://doi.org/10.70838/pemj.460202

Vuorikari, R., Kluzer, S., & Punie, Y. (2022). *DigComp 2.2: The digital competence framework for citizens—With new examples of knowledge, skills and attitudes*. Publications Office of the European Union. https://doi.org/10.2760/115376

Wang, F., Ni, X., Zhang, M., & Zhang, J. (2024). Educational digital inequality: A meta-analysis of the relationship between digital device use and academic performance in adolescents. *Computers & Education, 213*, Article 105003. https://doi.org/10.1016/j.compedu.2024.105003

Yousofi, R., Golzar, J., & Yacoub, O. (2025). Digital divides and bridges: Equity implications of EdTech in ESL education. *Frontiers in Education, 10*, Article 1590828. https://doi.org/10.3389/feduc.2025.1590828