WJSAM | World Journal of Sustainable Advances in Multidisciplinarity
RESEARCH | INNOVATION | INTERDISCIPLINARITY | SUSTAINABILITY
Volume 1, Issue 2 | ISSN: 3155-783X
DOI: https://doi.org/10.65339/wjsam.V1.I2.16

Teachers' Perceptions and Challenges on Information and Communication Technology (ICT) Integration in Edukasyong Pantahanan at Pangkabuhayan (EPP) Instruction in a Public Elementary School

Richel N. Dacalos
Master of Arts in Vocational Education, Cebu Technological University-Main Campus, Cebu City, Philippines

Email: richel.dacalos@deped.gov.ph

ABSTRACT

This study examined elementary teachers' perceptions of Information and Communication Technology (ICT) integration in Edukasyong Pantahanan at Pangkabuhayan (EPP), the tools used, implementation challenges, and the relationship between ICT availability and learners' academic performance in selected urban elementary schools in Mandaue City during School Year 2024–2025. Employing a descriptive-correlational research design, the study involved 50 teachers who completed an adapted questionnaire. Data were analyzed using percentages, weighted means, and Pearson's product–moment correlation. Findings revealed that presentation tools were most commonly used (62.00%), followed by online resources (32.00%). Teachers expressed favorable perceptions of ICT integration (overall mean = 4.06), particularly in supporting administrative tasks, learner motivation, and diverse learning needs. However, ICT tool availability showed no statistically significant relationship with EPP academic performance ($r = -0.050$), despite predominantly high reported academic ratings. Major challenges included lesson-planning time constraints (mean = 4.20) and limited ICT resources (mean = 4.12). The study concluded that favorable perceptions and technological availability alone did not establish improved academic performance. Contextualized technology-enhanced learning activities, continuous teacher development, collaborative planning, and strengthened institutional support were recommended. The selected-school sample, self-reported perceptions, and correlational design limited generalizability and causal interpretation. The findings provide a contextualized foundation for improving ICT-supported EPP instruction and guiding school-level decisions concerning instructional resources, teacher support, and practical learning activities.

Keywords: *Academic Performance, EPP Instruction, ICT Integration, Instructional Challenges, Teacher Perceptions, Technology-Enhanced Learning*

1. INTRODUCTION

1.1. Background and Context of the Study

Digital technology has become an important consideration in the design and delivery of basic education, particularly as schools seek to connect subject knowledge with the skills learners need beyond the classroom. Digital resources can support demonstration, communication, assessment, and access to instructional materials; however, their educational value depends on their suitability for particular learning objectives. The Organisation for Economic Co-operation and Development (OECD, 2023) emphasized that a functioning digital education ecosystem requires not only devices and connectivity but also teachers who can use them effectively. Similarly, UNESCO (2023) cautioned that decisions about educational technology should prioritize learners' needs, equity, and evidence of instructional value. In the Philippine elementary curriculum, Edukasyong Pantahanan at Pangkabuhayan (EPP) develops practical competencies associated with household management, entrepreneurship, and livelihood-related activities. Instruction in these areas often involves demonstrations, guided practice, and the application of skills to familiar situations. Videos, interactive materials, and digital presentations may supplement such experiences, although they cannot automatically replace hands-on learning. The Enhanced Basic Education Act of 2013 provides a broader foundation for learner-centered, contextualized, and research-based curriculum development (Republic of the Philippines, 2013). Within this context, the Technological Pedagogical Content Knowledge framework underscores the need to align instructional technology with both subject content and teaching strategies (Mishra & Koehler, 2006). Villanueva et al. (2023) discussed the instructional opportunities and implementation challenges associated with ICT integration at the elementary level. These considerations are especially relevant to EPP teachers, who must determine whether available tools strengthen demonstrations, participation, and practical skill development. In the selected urban elementary schools of Mandaue City, examining teachers' perceptions, available resources, and instructional challenges during school year 2024–2025 provided a context-specific basis for developing appropriate technology-enhanced learning activities.

1.2. Research Problem

The availability of information and communication technology (ICT) does not necessarily establish its effective use in classroom instruction. Teachers may recognize the value of digital resources while experiencing difficulties related to technological proficiency, lesson preparation, equipment, and support. In a Philippine study of physical education teachers, Magallanes et al. (2024) reported variation in ICT proficiency despite the availability of resources. Arnado and Aviles (2023) likewise documented technological skill and resource-related challenges among teachers and learners in Indigenous Peoples Education schools. Thus, endorsement of ICT does not necessarily indicate readiness for instructional integration. School-level conditions also shape the practical use of technology. Brasileño and Bidad (2021) described maintenance, software, connectivity, and access concerns in junior high schools in General Santos City, while Lambunao (2024) identified competency needs among public elementary teachers in Bukidnon. These studies examined settings and subjects different from EPP instruction in Mandaue City. In the present study, the relevant questions involved which ICT tools were available, how EPP teachers perceived their effectiveness, what challenges they experienced, and whether available tools were associated with learners' general academic performance. Addressing these questions was necessary because locally applicable instructional planning could not be derived directly from findings in other settings.

1.3. Research Gap

Existing Philippine research offers useful accounts of ICT integration, but its findings do not directly resolve the combined questions addressed by this study. Arnado and Aviles (2023) examined ICT-related skills and challenges in Indigenous Peoples Education schools, whereas Lambunao (2024) focused on the ICT competencies of elementary teachers in Bukidnon. Villanueva et al. (2023) discussed broader opportunities and obstacles in elementary-level technology integration. These contributions differ in setting, instructional emphasis, or measures considered. The specific gap addressed by this study involved the EPP-specific combination of teacher characteristics and training, available ICT tools, perceived instructional effectiveness, reported challenges, and learners' general academic performance in selected urban elementary schools of Mandaue City. The study also examined the relationship between ICT-tool availability and academic performance rather than assuming that access produces better outcomes. By addressing these dimensions together during school year 2024–2025, the study sought to provide an empirical basis for context-responsive Technology-Enhanced Learning Activities.

1.4. Purpose and Objectives of the Study

This study aimed to assess teachers' perceptions of ICT integration in the teaching and learning of EPP in selected urban elementary schools of Mandaue City during school year 2024–2025. Using a research-based questionnaire, it examined respondents' age, gender, educational attainment, teaching experience, and related seminars or training; learners' general academic performance in EPP; available instructional ICT tools; teachers' perceptions of the effectiveness of ICT integration; and the extent of challenges encountered. It also tested, at the 0.05 significance level, the null hypothesis of no significant relationship between learners' EPP academic performance and the available ICT tools used in instructional delivery. The findings served as the basis for developing Technology-Enhanced Learning Activities.

1.5. Significance and Practical Contribution of the Study

The study offers a school- and subject-specific basis for examining how ICT resources can support EPP instruction without overlooking teachers' practical concerns. Its findings may help school administrators and the Department of Education identify priorities for equipment support, relevant professional development, and instructional planning. EPP teachers may use the assessment to select digital materials that complement demonstrations and hands-on tasks, while learners may benefit from activities better aligned with their instructional needs. Parents and community stakeholders may also gain a clearer understanding of the resources and support involved in technology-assisted learning. Consistent with UNESCO's (2024) emphasis on supporting teachers, the proposed Technology-Enhanced Learning Activities are intended to provide a practical, locally grounded output rather than a solution to every implementation challenge.

1.6. Sustainable Development Goals (SDG) Alignment

The study aligns directly with Sustainable Development Goal 4: Quality Education, which emphasizes inclusive, equitable education and meaningful learning outcomes (United Nations Department of Economic and Social Affairs [UN DESA], 2025). Examining learners' general academic performance in EPP addresses the goal's concern with educational quality, while documenting teachers' training, perceptions, and instructional challenges provides information relevant to effective teaching. Assessing the availability of ICT tools may also inform decisions about resources and supportive learning environments. The proposed Technology-Enhanced Learning Activities are intended to support an EPP-specific application of these findings. This alignment does not assume that digital tools independently improve achievement; instead, it

emphasizes their purposeful use alongside appropriate pedagogy and practical learning experiences.

2. METHODOLOGY

2.1. Research Design

The study employed a descriptive-correlational research design to examine elementary teachers' perceptions of Information and Communication Technology (ICT) integration in teaching Edukasyong Pantahanan at Pangkabuhayan (EPP) during school year 2024–2025. It described teachers' profiles, learners' academic performance, available ICT tools, perceived effectiveness, and integration challenges. It also examined the relationship between EPP performance and available instructional ICT tools without manipulating the variables (Creswell & Creswell, 2023). This focus reflected the importance of evaluating technology use within educational contexts (OECD, 2023; UNESCO, 2023).

2.2. Research Locale, Population, and Participants or Respondents

The study was conducted in selected urban elementary schools in Mandaue City, Cebu, Philippines. The study involved 50 elementary school teachers who participated as respondents during the data collection period. Their profiles covered age, gender, highest educational attainment, teaching experience, and ICT-related seminars or training. The study also gathered information concerning their learners' general academic performance in EPP. The study focused on elementary teachers from the participating urban public elementary schools in Mandaue City, Cebu, Philippines. These schools constituted the research setting for examining ICT integration in EPP instruction during School Year 2024–2025.

2.3. Sampling Technique and Sample Determination

The study employed nonprobability convenience sampling to select elementary teachers based on their accessibility and participation during the data collection period. A total of 50 teachers were included in the study. The final sample consisted of 50 teachers. The final sample consisted of 50 participating teachers, with sample selection based on the sampling approach employed in the study rather than a reported population-based sample-size computation.

2.4. Research Instrument and Validation

The study used an English-language questionnaire adapted from Ghavifekr and Rosdy (2015). Its five parts addressed respondent profiles, learners' general academic performance in EPP, ICT tools available for teaching, teachers' perceptions of ICT integration effectiveness, and challenges encountered during integration. The perception and challenge items used five-point Likert responses from Strongly Disagree (1) to Strongly Agree (5). The questionnaire was adapted from Ghavifekr and Rosdy (2015), with its content organized according to the study objectives. The interpretation of the findings should consider the absence of separately documented validation and reliability results for the adapted instrument.

2.5. Data Gathering Procedure

Before data collection, the researcher sought permission from the identified respondents with the research adviser's recommendation. After permission was given, the researcher printed and personally distributed questionnaires to the pre-identified teachers to facilitate their administration. The researcher assisted respondents in completing the questionnaires. Following administration, the completed forms were retrieved, and the responses were organized and tabulated for statistical treatment. The collected data were analyzed and interpreted in accordance with the research objectives and served as the basis for developing

proposed Technology-Enhanced Learning Activities. No specific dates or response-rate calculation were reported.

2.6. Data Analysis and Statistical Treatment

Percentages summarized respondents' profiles, learners' general academic performance in EPP, and available ICT tools. Weighted means described perceived effectiveness and the extent of challenges associated with ICT integration. Pearson's product–moment correlation coefficient (r) tested the relationship between learners' general academic performance and available instructional ICT tools. Weighted-mean scores were interpreted using the following intervals: 4.21–5.00, Strongly Agree; 3.41–4.20, Agree; 2.61–3.40, Neutral; 1.81–2.60, Disagree; and 1.00–1.80, Strongly Disagree. Responses were tabulated, computed, and interpreted against the study objectives. The relationship between ICT tool availability and learners' academic performance was evaluated at the 0.05 level of significance.

2.7. Ethical Considerations

The researcher obtained permission from the identified teachers before questionnaire administration, following the research adviser's recommendation. Questionnaires were distributed and retrieved personally, and respondents received assistance during completion. The researcher obtained permission from the participating teachers before administering the questionnaires. Data collection was conducted through the personal distribution and retrieval of the research instruments, with assistance provided to respondents during questionnaire completion.

3. RESULTS AND DISCUSSION

3.1. Demographic and Professional Profile of Teacher Respondents

The respondent profile covered age, gender, educational attainment, teaching experience, and participation in related seminars or training. Among the 50 teachers, 25 (50.00%) were aged 40–49, 13 (26.00%) were aged 30–39, 10 (20.00%) were aged 20–29, and two (4.00%) were aged 50 years or above. The gender distribution comprised 28 male respondents (56.00%) and 22 female respondents (44.00%); no participant selected "prefer not to say" (0.00%). Each demographic category accounted for a total of 50 teachers (100.00%). The concentration of respondents in the 40–49-year age group reflected the composition of the participating teachers but did not establish a relationship between age and digital competence. Similarly, the gender distribution did not demonstrate differences in ICT integration by sex because the study did not report group-comparison tests for these characteristics. Mahawan et al. (2025), in a Philippine study, documented some differences in the types of ICT competencies reported by male and female teachers; these external findings should not be transferred directly to the present respondents. Peng et al. (2024), in contrast, found that attitudes, self-efficacy, and digital competence were important correlates of teachers' ICT integration, while most of their modeled relationships did not vary appreciably by sex or age. These findings suggest that demographic composition provides context, whereas actual ICT competencies and opportunities must be examined independently. The remaining professional characteristics included educational attainment, teaching experience, and related training. A total of 35 teachers (70.00%) reported master's-level study, including either units earned or degree completion, whereas 15 (30.00%) reported a bachelor's degree; none reported doctoral-level study. Teaching experience was most commonly 11–15 years (22, 44.00%), followed by more than 15 years (15, 30.00%), less than five years (10, 20.00%), and five to ten years (3, 6.00%). In terms of related professional learning, 40 teachers (80.00%) reported four to six seminars or training activities, compared with 10 (20.00%)

who reported zero to three. All three sets of professional categories each totaled 50 teachers (100.00%), and no respondent reported doctoral-level study (0.00%). The professional profile indicated substantial exposure to postgraduate study, teaching practice, and related seminars among the respondents. However, educational attainment and attendance counts were not direct measures of ICT proficiency or the quality of professional development. Baharuddin et al. (2024) examined professional development, lifelong learning, and teacher mindset as factors related to ICT integration, while Lorenz et al. (2022) identified teachers' technological pedagogical and content knowledge as a particularly relevant predictor of classroom ICT use. Cabansag (2025) likewise reported relatively strong elementary teachers' digital competencies alongside continuing resource constraints in a Philippine setting. Xu et al. (2025) found that external support, professional development, and teachers' internal factors operated together in explaining ICT integration ability. Collectively, the literature suggests that existing qualifications and training opportunities can provide a foundation for technology-supported EPP instruction, but their actual instructional effectiveness cannot be inferred from respondent-profile frequencies alone.

3.2. Distribution of Learners' General Academic Performance in EPP

The reported academic-performance ratings of learners in EPP were concentrated in the two highest performance categories. Specifically, the manuscript listed 29 entries (58.00%) as Outstanding, 18 (36.00%) as Very Satisfactory, and two (4.00%) as Satisfactory. It reported zero entries (0.00%) in both the Fairly Satisfactory and Did Not Meet Expectations categories. The distribution of learners' academic performance was summarized using the confirmed frequency and percentage for each performance category. The results showed that the majority of recorded EPP performance ratings were classified as Outstanding or Very Satisfactory. Despite the unresolved total, the reported categories indicated predominantly high EPP performance ratings. This distribution reflected generally favorable academic-performance ratings among the learners. However, the findings did not establish that ICT integration was responsible for the observed academic outcomes. Without a comparison group, baseline results, or an instructional-effect estimate, the observed ratings should be interpreted descriptively rather than as proof of improvement caused by technology. The literature offers a basis for understanding why technology-supported instruction may be relevant to these academic outcomes, while also cautioning against causal interpretation. Pino and Mongas (2025), studying elementary pupils in Bukidnon, reported an association between technology integration and pupils' cognitive engagement; their outcome concerned engagement rather than the EPP grades measured here. The systematic review by Msambwa et al. (2024) similarly emphasized that ICT benefits depend on meaningful pedagogical application and supporting conditions. UNESCO (2023) concluded that evidence of the effects of educational technology on learning varies by setting and implementation. Accordingly, the high performance categories in the study were consistent with satisfactory reported attainment, but they did not establish that the ICT tools used by these respondents caused higher EPP grades. Instructional design, learner characteristics, and the way ICT was employed remain relevant considerations for interpreting the distribution.

3.3. ICT Tools Used in EPP Instructional Delivery

The results showed the reported distribution of ICT tools used in the EPP teaching-delivery process. Presentation tools, specifically Microsoft PowerPoint and Google Slides, accounted for the largest category (31 responses, 62.00%). Online resources and websites, including YouTube

and TED-Ed, followed with 16 responses (32.00%), while interactive whiteboards and related tools accounted for three (6.00%). Learning management systems (Google Classroom, Edmodo, or Moodle), cloud storage tools (Google Drive or OneDrive), and online assessment or quiz platforms (Kahoot, Quizizz, or Google Forms) each received zero responses (0.00%). The distribution totaled 50 responses (100.00%). The distribution demonstrated a concentration on presentation-based instruction and curated online materials rather than learning management, cloud storage, or online assessment platforms within the available responses. The pattern may be related to the immediate usefulness of slides and videos for explaining EPP procedures and demonstrating practical tasks, although the survey did not directly examine teachers' reasons for choosing particular tools. The absence of responses in several categories should therefore be read as an absence within the reported categories, not proof that all such tools were unavailable across the schools. OECD (2023) distinguished basic digital operations from the pedagogical competence needed to select appropriate instructional technologies. The data consequently describe the tools reported by teachers rather than the instructional quality of their application. The dominance of presentation and online-resource tools was compatible with research that stresses curriculum alignment and purposeful digital instruction. Msambwa et al. (2024) concluded that teacher preparation, access, and a supportive school environment shape effective ICT integration. König et al. (2024) identified integrating technology into lesson plans as a specific professional skill, rather than a simple consequence of possessing technical knowledge. Xu et al. (2025) further highlighted the interplay of external support, professional development, and motivation in teachers' ICT integration ability. These studies help explain why a narrow range of tools need not be educationally ineffective, but also why the number or type of tools alone is an insufficient indicator of teaching quality. For EPP, the practical priority is to select and adapt resources that support demonstrations, problem-solving activities, and assessment rather than expanding the digital-tool inventory without an instructional purpose.

3.4. Teachers' Perceived Effectiveness of ICT Integration

Teachers generally expressed favorable perceptions of ICT integration in the EPP teaching-learning process. The reported overall mean was 4.06, interpreted as Agree under the study's five-point scale. The highest-rated statement concerned the preparation of reports for grading, assessment, lesson planning, record-keeping, communication, and scheduling (mean = 4.80, Strongly Agree). The statements on learner motivation and interest and on supporting learners with diverse needs and learning styles each received 4.60 (Strongly Agree), followed by creativity and imagination (4.50, Strongly Agree) and administrative task management (4.40, Strongly Agree). Other favorably rated indicators were enhanced communication with classmates (mean = 4.20, Agree); greater integration between tools and platforms (4.00, Agree); peer interaction during group activities (4.00, Agree); reduced time on administrative work (4.00, Agree); improved communication among teachers, learners, and parents (4.00, Agree); and smoother use of Microsoft Office applications, including Word, Excel, and PowerPoint (4.00, Agree). Better user interfaces and ease of use received 3.80 (Agree), while the availability of more interactive features received 3.60 (Agree). Respondents were neutral on the affordability of ICT tools (3.40) and improved accessibility for students with disabilities (3.00). Under the original scale, means of 4.21–5.00 indicated Strongly Agree, 3.41–4.20 Agree, 2.61–3.40 Neutral, 1.81–2.60 Disagree, and 1.00–1.80 Strongly Disagree. These responses suggested that teachers appreciated ICT for administrative organization as well as perceived instructional benefits. The particularly high score for report preparation indicated a practical use extending beyond classroom presentation. Presbitero and Obiso (2025), studying digital-tool use and administrative efficiency in Philippine

basic education, reported a significant association between these constructs, providing a relevant comparison for the respondents' favorable views. However, such benefits should not be assumed to occur in every implementation: Moraiti et al. (2025) observed that poorly integrated digital administration platforms could intensify teachers' work rather than reduce it. The present mean of 4.80 reflected agreement about perceived usefulness, not an independently measured decrease in hours spent on reports or other administrative tasks. Respondents also expressed strong agreement that ICT supported learner motivation, diverse learning needs, and creativity. Pino and Mongas (2025) found a positive relationship between classroom technology integration and pupils' cognitive engagement in a Philippine elementary-school context. Akram et al. (2022), reviewing teachers' perceptions, likewise identified student engagement and instructional opportunities among the commonly reported advantages of ICT use. At the same time, Cabero-Almenara et al. (2022) emphasized that assisting students with disabilities through digital technologies requires particular teacher competencies; accessibility cannot be inferred solely from the presence of multimedia resources. Thus, the present ratings described teachers' favorable perceptions of potential instructional benefits, rather than direct observations or tests of changes in pupils' motivation, creativity, or inclusion. The lowest ratings qualified the generally positive assessment. Improved accessibility for students with disabilities received 3.00 (Neutral), whereas tool affordability received 3.40 (Neutral). The contrast between strong agreement that ICT could enhance learning for students with diverse needs (4.60) and a neutral assessment of actual accessibility (3.00) suggested a distinction between perceived educational potential and implementation conditions. Cabero-Almenara et al. (2022) identified teachers' digital competence as a relevant consideration for supporting students with functional diversity, while UNESCO (2023) noted that equitable access requires attention to learners' needs and available resources. OECD (2023) similarly warned that connectivity and devices, although necessary, do not by themselves ensure effective digital education. The findings therefore support giving accessibility, appropriate adaptation, and affordability explicit attention when planning EPP technology integration, rather than equating overall positive perceptions with universal accessibility.

3.5. Relationship Between ICT Tool Availability and EPP Academic Performance

The reported correlation analysis assessed the relationship between learners' general academic performance in EPP and the ICT tools used in instructional delivery. The correlation coefficient was $r = -0.050$, with a computed t-value of -0.347 and 48 degrees of freedom. At the 0.05 significance level, the critical t-value for a two-tailed test with 48 degrees of freedom was approximately ± 2.011. The absolute computed t-value was lower than the critical value at the 0.05 significance level. Consequently, the null hypothesis was not rejected, indicating that the relationship between ICT tool availability and learners' academic performance was not statistically significant. The coefficient was negative and close to zero, indicating a very weak negative linear association in the reported data. The non-significant test result did not establish that ICT had no instructional value, nor did it justify a causal conclusion about technology and achievement. Instead, it indicated that the measured availability or use of ICT categories was not statistically associated with the recorded EPP performance measure under the test and decision criterion reported in the manuscript. This result qualified the favorable academic-performance distribution and teachers' positive perceptions reported earlier: both were observed in the same study despite a correlation that did not meet the stated significance criterion. In a separate study, Xu et al. (2025) found that external support and professional development were related to teachers' ICT integration ability, emphasizing factors beyond the mere presence of tools.

Msambwa et al. (2024) similarly characterized ICT integration as dependent on instructional alignment, teacher capacity, and enabling resources. OECD (2023) and UNESCO (2023) cautioned that investment in devices and digital infrastructure does not automatically lead to better learning. These sources offer an explanation for why availability alone might be an incomplete measure of instructional value, but they do not identify the causes of the present near-zero correlation. The current analysis did not directly test lesson quality, frequency of tool use, or learner engagement as possible intervening factors. The practical implication was that ICT availability should not be treated as a sufficient indicator of instructional effectiveness. Educational decisions would benefit from examining how tools are selected, embedded in EPP activities, and supported by teaching practices. The observed non-significant relationship remained an important result because it prevented the favorable descriptive findings from being overstated as evidence of an achievement effect.

3.6. Challenges Encountered in Integrating ICT into EPP

The study examined the challenges encountered by teachers in integrating ICT into EPP instruction. The overall mean was 3.25 (Neutral), indicating that the respondents did not uniformly agree that the challenges were prevalent. The highest-rated concern was time constraints for lesson planning (mean = 4.20, Agree), followed by limited access to ICT resources (4.12, Agree), student engagement and distractions (4.00, Agree), and inadequate infrastructure and technical support (3.60, Agree). These scores identified practical constraints even though the overall rating was neutral. Lesson-planning time was the most prominent reported barrier, consistent with the additional preparation needed to identify suitable resources, design relevant EPP activities, and arrange technical support. König et al. (2024) described ICT integration in lesson plans as a distinct professional competence requiring more than familiarity with digital devices. Akram et al. (2022) similarly identified time limitations, infrastructure, and technical support as recurring barriers in teachers' experiences. The high concern about access to ICT resources was also consistent with Cabansag's (2025) findings among Philippine elementary teachers, where digital competence coexisted with equipment and internet constraints. Msambwa et al. (2024) argued that effective integration requires coordinated attention to teacher preparation and the school environment. Accordingly, the reported challenges point to the importance of planning support and dependable resources, not simply more encouragement for teachers to use technology. The responses also differentiated major concerns from those that were less consistently endorsed. Teacher training and digital literacy received 2.96 (Neutral), resistance to change 2.90 (Neutral), and technological-tool overload 2.80 (Neutral). Curriculum and content compatibility received 2.50 (Disagree), and the impact on hands-on learning received 2.60 (Disagree). Unequal student access received a mean score of 2.90, interpreted as Neutral according to the study's five-point rating scale. These resource-related challenges reflected broader concerns regarding equitable digital access, institutional support, and continuous professional development in educational settings (UNESCO, 2023). Taken together, the results suggested that workload, resource access, infrastructure, and potential classroom distraction were more salient challenges for this respondent group than broad resistance to technology or curricular incompatibility. This distinction is relevant because teachers may view digital tools favorably while still facing structural constraints when attempting to use them. Peng et al. (2024) identified teachers' attitudes and digital competence as important correlates of ICT integration, while UNESCO (2023) emphasized the importance of access and teacher preparedness. Practical responses in EPP should therefore prioritize usable teaching materials, adequate preparation time, technical assistance, and equitable resources alongside

professional learning. These implications follow from the teachers' reported perceptions and should not be interpreted as evidence that any particular intervention has already improved academic performance.

4. CONCLUSIONS AND RECOMMENDATIONS

The study concluded that integrating Information and Communication Technology (ICT) tools into Edukasyong Pantahanan at Pangkabuhayan (EPP) instruction was positively perceived by teachers in selected urban elementary schools in Mandaue City during School Year 2024–2025. Teachers recognized the usefulness of ICT in facilitating instructional tasks, enhancing learners' motivation and interest, addressing diverse learning needs, and encouraging creativity. Despite these favorable perceptions and the generally outstanding to very satisfactory academic performance of learners, no significant relationship was established between learners' academic performance in EPP and the availability of ICT tools used in teaching. This finding indicated that the availability of technological resources alone was not significantly associated with academic achievement within the study context. Furthermore, the predominance of presentation tools and online resources, alongside concerns regarding instructional preparation time and resource accessibility, highlighted areas requiring improvement. Overall, the findings emphasized the importance of purposeful ICT integration supported by appropriate instructional practices and institutional resources.

Based on the findings, teachers are encouraged to strengthen learner-centered, interactive, and skills-based instructional approaches through the purposeful integration of available ICT tools in EPP lessons. The Technology-Enhanced Learning Activities developed from the study are recommended for adoption and contextualized implementation to support meaningful learning experiences aligned with EPP competencies. Teachers should participate in continuous professional development activities focusing on digital presentations, educational videos, interactive learning materials, and appropriate technological applications. School administrators should prioritize adequate ICT equipment, reliable internet connectivity, technical assistance, and accessible instructional resources to address the challenges identified by respondents. Mentoring programs, collaborative lesson planning, and peer-sharing activities should also be strengthened to improve teachers' competence and efficiency in technology-supported instruction. Furthermore, school heads and teachers should regularly evaluate the implementation of Technology-Enhanced Learning Activities to determine their instructional usefulness and identify necessary improvements based on learners' needs and classroom conditions.

The study was limited to teachers from selected urban elementary schools in Mandaue City during School Year 2024–2025, which restricted the applicability of its findings to other educational settings. Its descriptive-correlational design examined relationships between variables but did not establish causal effects. Furthermore, teachers' perceptions of ICT effectiveness and integration challenges were assessed through questionnaire responses, reflecting their reported instructional experiences. The findings were also situated within the ICT resources and instructional conditions of the participating schools. Future investigations may include broader educational settings, additional respondents, and alternative research approaches to examine ICT integration and its relationship with EPP academic performance more comprehensively.

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