

Strategic Integration of Educational Technologies in Nursing Higher Education Institutions: A Framework for Digital Transformation

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ABSTRACT

Digital technologies have transformed nursing education in the Philippines across teaching, clinical training, assessment, and communication. Grounded in the Technology–Organization–Environment (TOE) Framework, this qualitative descriptive study examined how Philippine nursing higher education institutions (HEIs) utilize educational technologies, identified key facilitators and barriers, and sought to develop a framework for sustainable digital transformation. Semi-structured interviews were conducted with 13 faculty members and administrators across three institutions: one state university and two private schools. Results indicated that tech adoption accelerated rapidly during the COVID-19 pandemic driven by immediate remote-learning needs rather than strategic

planning; nevertheless, blended learning persisted after in-person classes resumed. Key facilitators included administrative leadership, faculty training, and basic ICT access. Conversely, major barriers hindered long-term sustainability, including funding limitations, unreliable internet connectivity, inadequate technical support, digital skill gaps, resistance to change, heavy workloads, and a lack of post-training follow-up. Crucially, a gap emerged between institutional support and execution: while HEIs recognized technology's value, the absence of strategic roadmaps, continuous training, robust infrastructure, and regular evaluation led to fragmented implementation. These insights validate the TOE Framework by demonstrating that technological capability, organizational readiness, and environmental factors jointly govern digital integration, highlighting the urgent necessity for long-term strategic plans and sustainable digital transformation frameworks in Philippine nursing education.

Keywords: *digital transformation, educational technologies, nursing education, strategic management, Technology-Organization-Environment (TOE) framework*

INTRODUCTION

Digital transformation (DT) goes beyond adopting new technologies; it requires changes to institutional strategies, teaching methods, governance, and working practices so that digital tools can effectively improve learning, efficiency, and student engagement. Successful digital transformation depends on several factors, including institutional support, sufficient infrastructure, faculty readiness, curriculum development, and regular evaluation. Therefore, digital transformation should be seen as an ongoing institutional process rather than merely buying or using digital technologies (Benavides et al., 2020).

Nursing education is undergoing significant change as technology becomes more integrated into both teaching and clinical practice, driven by rapid technological advancement, the globalization of

healthcare, and the growing need for nurses to work in data-based clinical environments. Studies by Cant & Cooper (2009) and Görücü et al. (2024) show that digital teaching methods support effective teaching and learning in Nursing education. Still, they must balance traditional clinical competencies with emerging digital competencies, such as informatics, simulation literacy, and e-learning adaptability.

Globally, recent scholarship identifies DT in nursing education as encompassing not only virtual and augmented reality simulation, telehealth-based clinical instruction, learning analytics, and adaptive platforms, but also the underlying organizational change: leadership commitment, digital culture, faculty roles, policy/regulatory alignment, and sustainable financing. Like, how digital transformation models for nursing education must consider generative AI, virtual reality, and immersive learning as part of a broader paradigm shift (Koike & Majima, 2025). In addition, digital health education is cost-effective in supporting health education. It positions digital transformation of nursing as a key future domain (PAHO 2024).

Despite this global shift in nursing education, many nursing programs, including nursing informatics programs in developing countries, struggle to consistently integrate educational technologies (Rosales & Tamayo, 2025). Recent reviews find that blended and technology-enhanced pedagogies often improve satisfaction, self-efficacy, and work readiness among nursing students; however, adoption depends on educators' digital literacy, institutional support, and reliable infrastructure, all of which vary widely across Philippine HEIs. (Wang & Raman, 2024).

Despite efforts to advance digital transformation, many nursing higher education institutions in the Philippines still face fragmented, inconsistent integration of technology in education. Institutions lack a unified strategic framework to align technology adoption with both educational outcomes and institutional goals.

Philippine HEIs face particular opportunities and constraints in this transition. National policy initiatives and sector reviews emphasize flexible learning and Learning Management Systems.

Adoption, campus networking, and learner information systems are priorities for the country's higher education digitalization agenda. The evaluation of digital transformation readiness in public institutions shows that readiness levels vary across private institutions. These include difficulties with internet connectivity, insufficient IT infrastructure, and faculty members' digital skills. These factors should be considered when planning digital transformation in nursing programs (World Bank, 2022).

Digital technologies show positive outcomes in simulation and blended learning. However, evidence is lacking on how institutional policies, faculty development, and curriculum alignment affect digital transformation outcomes (Cant & Cooper, 2009). Developing a practical framework that accounts for these institutional and educational factors could help overcome this implementation gap. Moreover, technology use in nursing education continues to increase. Nevertheless, acceptance of this technology by both faculty and students remains key to ensuring its effective use in both classroom and clinical settings (Gause et al., 2022).

Nursing education needs learning outcomes closely tied to real clinical practice; digital technologies should therefore not only improve access to information or make teaching more convenient but also support the development and assessment of clinical knowledge, decision-making, technical skills, and safe patient care.

Rigorous research is needed to determine which digital technologies effectively enhance clinical practice, identify knowledge and skills that transfer well to real-world practice, and define areas where individual training remains indispensable. This evidence base reduces risk when institutions substitute or augment clinical hours with simulation/virtual learning. (Sim et al., 2022). Consequently, establishing a strategic framework is an urgent need to guide nursing HEIs in integrating educational technologies systematically and sustainably (Wang, Decker, & Bevan, 2023). These challenges call for improved faculty technological skills and better curriculum alignment. Evidence-based research is the best way to assess faculty clinical and digital skills, map the curriculum, and identify gaps or confusion about what to improve (Prosen & Ličen, 2025).

The study aims to provide evidence on how nursing programs incorporate technologies to help students and faculty become clinically competent, improve critical thinking, and build digital literacy. The results could help higher education institutions create a framework for sustainably implementing digital technologies. This also helps improve the quality of nursing education and enables future nurses to work effectively in healthcare environments that use digital technologies.

Learning Management Systems (LMS)

Learning Management Systems (LMS) are widely accepted in many Philippine HEIs. However, several challenges remain, particularly regarding digital infrastructure and teacher training and support. In addition, A broader investigation of LMS acceptance among Filipino college students (using the Technology Acceptance Model or TAM) identified factors such as internet connectivity experience, system interactivity, and social media influence as significant predictors of LMS acceptance, pointing to structural (connectivity) and social factors that limit strategic, uniform integration across institutions (Garcia, M., 2017).

Moreover, strategic integration (institutional policies, training, quality assurance) is inconsistent; connectivity and instructor capacity remain decisive (Roa et al., 2023). Globally, virtual/clinical virtual simulation has strong evidence for improving clinical reasoning and knowledge; however, many virtual simulation studies are from higher-income countries (Padilha et al., 2019). Simulation shows an upward trend in educational competencies and is a vital teaching approach in nursing. However, integrating educational technologies into curricula and faculty practices remains limited because various factors affect their adoption and implementation. According to Benchadliā et al. (2023), teachers primarily use simulation through procedural exercises, role-plays, and hybrid approaches to develop technical skills, communication abilities, and emergency management competencies. Limited institutional resources can affect how nursing education uses technology. Pananganan (2023) noted that high-fidelity simulation has advantages, but it is limited in local institutions because of high maintenance costs and insufficient faculty training. In addition, Carpio et al. (2024) found that nursing instructors at Western Mindanao State University feel nervous using simulation equipment because of limited training, inadequate technical support, and heavy workloads, which affect their confidence in using technology consistently and effectively.

This highlights resource gaps for full-scale adoption in resource-constrained Philippine HEIs. This limits the local strategic deployment of advanced simulation technologies. Leadership commitment and a clear institutional digitalization strategy predict successful digital transformation outcomes in terms of institutional readiness, speed of technology adoption, and integration into the curriculum. Niță & Guțu (2023) found that leadership and strategic integration in HE significantly influence digital information. Developing an institutional ecosystem can shape university digitalization outcomes (Valdés et al. 2021). Moreover, Martínez et al. (2024) report that nurse leaders and managers who appreciate digital transformation predict better institutional outcomes. However, they also noted that factors such as a lack of competence, costs, and lack of institutional support are barriers. Systematic barrier analyses (Gkrimpizi et al., 2023) also classify infrastructure and funding shortfalls as primary barriers to digital transformation in HEIs and link them to weaker outcomes.

Faculty digital competence, attitudes, and availability of continuing professional development are strong predictors of educational quality after DT. Ndaba et al. (2024) and Prosen et al. (2025) point to staff digital competence and pedagogical support as key determinants of teacher adaptation and student learning outcomes.

Conceptual Framework

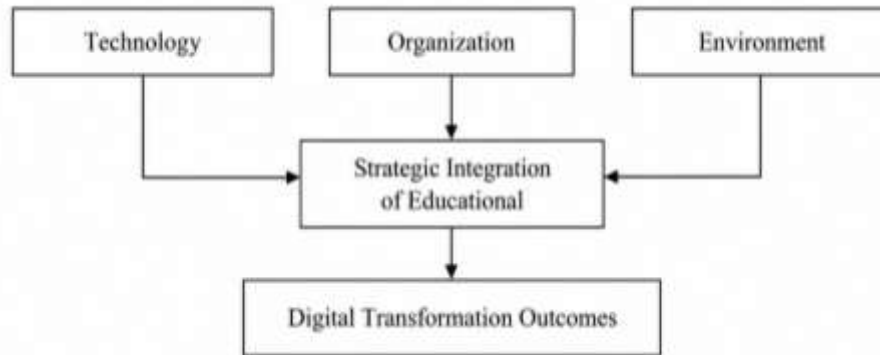


Figure 1. *Conceptual Framework*

The study uses the Technology–Organization–Environment (TOE) Framework, developed by Baker in 2012. The framework explains technology adoption in an organization through technology, organization, and environment. It is used to study how technology changes how nursing students learn and how nursing education is taught. In addition, technology adoption depends on technology availability, the institution's internal resources, and the external environment. The TOE framework was used to examine the independent variables affecting digital transformation.

Digital Resources and infrastructure include internet connectivity, simulation laboratories, learning management systems, technical support, and faculty digital skills. The Organization involves leadership support, institutional policies, faculty capabilities, workload, incentives, curriculum development, and quality assurance. The environment includes CHED policies, accreditation requirements, the nation's digitalization initiatives, and external or internal funding opportunities.

Digital Transformation Outcomes are the results of using technology, such as improvements in teaching and learning, evident student skills, and school performance. The framework holds that sufficient technological resources, favorable organizational conditions, and a positive external environment can promote digital transformation; conversely, limited resources, insufficient faculty preparation, and weak institutional support may obstruct its implementation.

Thus, the proposed relationship is:

Technological Context + Organizational Context + Environmental Context → Digital Transformation Outcomes

The study will use this framework to identify factors that affect digital transformation and develop a practical framework for nursing education in the Philippines.

METHODS

Research Design

The study used a qualitative descriptive approach and collected primary data through semi-structured interviews. This method was suitable for investigating the experiences, practices, and viewpoints of the various stakeholders taking part in the integration of educational technologies into nursing education (Fernández & Oliver, 2025); it also enabled the researcher to look at the factors that affect technology integration in different types of institutional settings (Castleberry & Nolen, 2018).

Setting and Participants

The researcher conducted the study at three higher education institutions in the Philippines (HEIs) that offer a Bachelor of Science in Nursing degree. The group consisted of one state university (SUC) and

two private HEIs, selected based on institutional type, geographic location, enrollment size, accreditation status, degree of technology integration, and willingness to participate. The study used purposive sampling to select administrators and faculty members directly involved in teaching, administration, or educational technology use. The study was conducted at two private higher education institutions and a state university. The participants had to be full-time employees who had worked at the institution for at least one year and who were engaged in teaching, administrative work, or providing technology support, as well as those who were willing to take part and who gave informed consent; the study omitted part-time staff and anyone who refused to take part. Interviews continued until data saturation was achieved or no further themes emerged.

Research Instrument

The study used a semi-structured interview guide as its main research tool; it included five main questions and further probes based on the research objectives (Kallio et al., 2016). The questions addressed the institution's experience integrating technology, the factors that facilitated or hindered this process, current practices, and future directions for technology integration.

Data Gathering Procedure

Before data collection, the researcher secured written permission from the participating institutions and obtained informed consent from each participant. The researcher identified eligible participants with the institution's representatives and invited them through personal communication.

The interviews lasted approximately 20 to 30 minutes and were audio-recorded with participants' permission; during the interviews, the researcher also noted relevant observations. The researcher typed up the recordings verbatim and sent the transcripts to the participants via a secure email system for member checking.

The researcher kept the audio recordings and transcripts in a password-protected folder accessible only to the researcher. After transcribing and checking the audio files, the researcher deleted them but kept the transcripts on file until the study was completed and the final report was prepared.

Data Analysis

The data analysis followed Braun and Clarke's (2006) six-stage approach to thematic analysis: becoming familiar with the data, initial coding, searching for themes, reviewing themes, defining and naming themes, and writing the report. This methodology enabled the identification of common patterns and themes in the interview data (Kiger & Varpio, 2020). The transcripts were organized using NVivo software, which also supported coding and management of the themes that emerged from the data.

Ethical Considerations

Ethical considerations helped participants feel comfortable. If they asked, participants received copies of the research results to confirm that the study followed ethical guidelines. There were no conflicts of interest between the participants and the researcher, and the study raised no moral issues.

Voluntary Participation: Taking part in the research was completely optional. Participants and their guardians could withdraw their consent or stop participating at any time during the study or training.

Confidentiality: Before the activity began, the researcher explained that no names would be shared, no matter the outcome. The researcher used codes instead of names to protect participants' identities. Only the researcher had access to the data.

RESULTS AND DISCUSSION

1. Gap Between Aspiration and Reality

Although institutions are committed to the use of technology, they encounter great difficulties since they do not have sufficient resources and infrastructure.

2. Crisis-Responsive vs. Strategic Planning

The effect of external factors such as the pandemic and the need to meet accreditation requirements is greater than that of careful strategic planning when it comes to the adoption of technology.

3. Leadership Commitment Without Resource Backing

Although leaders often show support, it is not always backed by infrastructure.

4. Training-Implementation Gap

Although training is available, it is not provided continuously, monitored, or reinforced, resulting in only minor changes in practice.

5. Internet Connectivity as the Great Equalizer

Even if other resources or training are available, poor internet connections prevent most educational technologies from being used effectively.

The results support the Technology-Organization-Environment (TOE) framework Baker proposed in 2011 for nursing education in the Philippines. Although OBE and CMO 19 promote flexibility and continuity and encourage technology adoption, the latter's complexity may hinder implementation. Strong leadership can strengthen the organization, but limited resources make it difficult to implement plans. Training is available, but workload and poor planning make it difficult to sustain. The pandemic, health crises, and institutional accreditation also increased the need for technology, while limited government funding creates problems.

Philippines is prone to disasters; schools need flexible learning methodology. Financial constraints and senior faculty can also make it difficult for younger faculty to support older faculty who may be hesitant to adopt new technology.

Strategic Framework

Interdependence among technology, organization, and environmental conditions shapes the integration of educational technologies in nursing education in the Philippines. The results show that the Technology–Organization–Environment (TOE) framework offers a holistic strategic guide for digital transformation among Higher Education Institutions (HEIs).

Technology Domain

The framework's technology domain shows the extent of technological use and the limitations that affect its further development. During the health crisis (pandemic), digital use rapidly increased as institutions shifted from face-to-face to online and blended learning. Although some tools were available before COVID-19, they were only then fully appreciated and used for learning. This sudden shift established a basic level of digital competence for both teachers and students, as seen in its continued use after the pandemic. Today, hybrid and blended learning models are standard in lectures, clinical training, and community learning, showing that technology is now a regular teaching tool. However, despite these advantages, many institutions cannot fully use them. Most institutions find that limited resources and a lack of subscriptions prevent them from using simulation equipment. Even when they have high-fidelity mannequins or learning management systems, they often don't use them because staff don't know how to operate them.

These tools often go underused because people lack the skills to operate them or don't have the necessary technology. One major problem is internet connectivity. Because Wi-Fi is unstable, students and faculty struggle to use real-time, interactive digital tools. Inconsistent connections make them hard to use effectively. Therefore, they need reliable internet connectivity, updated computers and software, and ongoing technical support to maximize these benefits.

Organization Domain

The organization's cultural frameworks examine how management, capabilities, and culture affect technology use. Leadership plays a significant role in promoting technological adoption in the institution. However, even when leaders support innovation and digital transformation, many faculty members are unaware of clear strategic digital transformation plans and lack a clear path to implement change. This suggests that technology is often implemented ad hoc, without a well-developed plan or strategy. Although some institutions have digital transformation plans, indicating growing awareness, they have not yet fully adopted them in daily operations or embedded them culturally.

Faculty skills and adoption are key to the organization. The results indicate that senior faculty show some resistance, creating gaps in digital skills and making it more difficult to use technology effectively. Although institutions provide training, it is one-time and merely supervised, not continuous development or training for the faculty. Many faculty members do not join the training because of workload and RLE duties. This creates gaps in training needs and implementation; faculty do not translate the digital skills acquired through training into the classroom because of workload, consistency, and proficiency.

Environmental Domain

External factors contribute to the challenges of an institution's digitalization, such as poor internet connectivity, students' financial difficulties, and insufficient resources. These challenges make it difficult for institutions to implement digitalization plans. The national government and CHED provide no clear guidelines; instead, institutions determine how to make things work based on the resources available.

All institutions have different resources and support, so their levels of digital transformation may also differ. Schools need government funding to implement digitalization, support from CHED, professional groups, and partnerships with technology companies to improve digital education in the long term.

These three areas form a strategic framework for digital transformation in nursing education. Environmental factors explain that during the pandemic, institutional accreditation and regulatory requirements forced schools to adopt technology changes even when they lacked the knowledge and resources to do so. The availability and quality of institutional technology determine how institutions can achieve a vision of a fully digitalized institution. Internally, factors such as leadership, faculty skills, training offerings, resistance to and acceptance of change, and workload influence how extensively and for how long technology is used.

The framework shows that technology enables the situation, the environment puts pressure, but the organization determines how to minimize and mitigate its effects and adapt to the challenges, which affects whether efforts succeed. If the organization does not develop continuous faculty development and planning, technological improvement will not take place. Similarly, without a strong technology infrastructure, the organization's efforts fall apart. The environment is a key factor in closing these gaps. The Digital Transformation Framework is a comprehensive, five-pillar, cyclical model designed to help Higher Education Institutions (HEIs) incorporate educational technologies with a purpose, sustainable, and aligned outcomes. The framework is based on findings and directly addresses persistent problems such as reactive technology adoption, limited resources, faculty resistance, and a lack of clear institutional policies and monitoring systems.

The strategic framework for digital transformation serves as a roadmap for institutional development and directly contributes to the Sustainable Development Agenda, specifically SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), SDG 11 (Sustainable Cities and Communities), and SDG 16 (Peace, Justice, and Strong Institutions). It ensures that digital transformation promotes development, ethical governance, innovation, and lifelong learning.

Pillar 1: Leadership, Governance, and Strategic Vision

The first pillar lays the foundation for strong leadership and sustains digital transformation. Rather than reacting to challenges, the institutions developed a clear Digital Transformation Strategy that includes classroom digitalization, laboratory upgrades, simulation facilities, and AI tools. The Digital Transformation Committee and EdTech subscribers ensured that accountability and consistency were observed smoothly. With a clear vision, this pillar helps close the gap between what the organization wants to achieve and how it implements it. It helps support transparency in planning and budgeting across the colleges.

In addition, leadership is an asset and a solution for coordination and policy issues. Strong leadership commitment helps address issues like resistance to technology and weak decision-making by developing a clear Digital Transformation Plan and establishing a working committee for coaching and monitoring; leadership turns strengths into a system that improves planning, budgeting, and the workforce across the institution.

Moreover, institutions should seek external opportunities, such as national policies, professional networks, and CHED-led digital projects. These work best when governance is stable. Planning mitigates risks from new regulations, cybersecurity issues, and technological changes, helping institutions set a clear direction and become more resilient. Pillar 1 ensures leadership decisions are based on a realistic view of the institution's strengths and the broader policy and technology landscape.

Furthermore, it aims to improve how institutions align with SDG 16, ensuring they are accountable, transparent, and inclusive. Institutions do this by setting clear policies for applying LMS, digital classrooms, simulation technology, and AI tools. These establish ethical, consistent, and future-ready governance. This digital transformation is not just about acquiring, upgrading, or developing tools; it is about governing change and building a new culture.

Pillar 2: Faculty Digital Competency and Development

The second pillar helps staff become confident, skilled digital educators. A clear Digital Skills Competency Framework guides staff as they move from basic to advanced skills. Instead of short, one-off training sessions, development is ongoing, with mentoring programs like 'Digital Buddies' available for senior staff.

Digital skills now feature in performance reviews and teaching portfolios to encourage real use, not just box-ticking. Incentives, recognition programs, and workload support help staff move from resisting digital teaching to actively taking part, making digital methods a normal part of the institution.

The second pillar addresses the different levels of digital competence and inconsistent readiness among faculty members. Through a structured Digital Skills Competency Framework, faculty members can move from basic to advanced proficiency, turning this weakness into a growing strength for the institution. Continuous mentoring schemes such as "Digital Buddies" will strengthen competent faculty members and use peer mentoring to drive cultural and pedagogical change.

It also leverages external opportunities created by rapid advances in educational technology, freely accessible professional development programs, and leading global practices in digital teaching methodologies. When institutions integrate digital competency into performance assessments and teaching portfolios, faculty involvement becomes authentic and enduring rather than driven merely by compliance.

Consequently, institutions can effectively manage challenges such as digital fatigue, resistance to adaptation, and the risk of skill obsolescence associated with AI. Institutions can build these resources by investing in development pathways that are encouraging, inspiring, and well-organized. Therefore, Pillar 2 transforms faculty from hesitant participants into empowered collaborators in digital transformation.

Pillar 2 focuses on upskilling institutional personnel to foster an inclusive, high-quality, technology-enhanced learning environment. Through continuous professional development, digital mentoring, standardized competency frameworks, and performance-based teaching metrics, the institution equips educators to lead effective digital instruction and prepare a future-ready workforce.

Pillar 3: Digital Infrastructure, Connectivity, and Technical Support

Pillar 3 focuses on technology use. It means the school provides the right support: high-speed internet, guaranteed bandwidth, and classrooms equipped with up-to-date, functional equipment. When digital problems arise, a fast-response helpdesk is ready to troubleshoot right away. The helpdesk will also address external digital threats, such as cybersecurity risks and obsolescence from emerging technologies. It does this in partnership with CHED, DOH, DOST, and other national and local government agencies that provide funding. Moreover, strong linkages increase institutional resilience. Fair rules govern the use of simulation laboratories. Finally, inventory checks ensure that resources are used efficiently, rather than left unused. The pillar aligns with SDG 8 and SDG 9 by ensuring digital transformation is not only doable but also financially sustainable and promotes growth. It also supports SDG 11 (Sustainable Cities and Communities) by building a dependable and inclusive digital ecosystem, ensuring access to high-quality learning tools for every student.

Pillar 4: Financial and External Support Systems

Digital transformation cannot exist without funding. The fourth pillar provides the financial and partnership support strategy needed to sustain digital transformation. It focuses on securing the annual budget for digitalization. To do this, institutions can ask for assistance from government agencies such as DOST, CHED, DOH, and other Local Government Units (LGU's) through the creation of a partnership agreement.

Pillar 5: Phased Implementation, Monitoring, and Continuous Improvement

Pillar 5 establishes digital transformation as an iterative, data-driven cycle rather than a single event. Aligned with the ADDIE instructional design model and Continuous Quality Improvement (CQI) frameworks, implementation follows five structured phases: needs assessment, pilot testing, scaling, systematic monitoring, and process refinement.

Progress is measured through quantitative and qualitative inputs—including Learning Management System (LMS) analytics, classroom observations, equipment utilization reports, reflection logs, and student feedback. These metrics feed into a Digital Transformation Scorecard to enable transparent, evidence-based decision-making and mitigate implementation risks such as project fatigue or unscalable pilots.

Theoretical and Strategic Framework Alignment

This pillar integrates the Diffusion of Innovation Theory, Technology Acceptance Model (TAM), digital maturity models, and CHED Outcomes-Based Education guidelines (CMO Nos. 15 and 19) to ensure nursing education remains regulatory-compliant, evidence-based, and learner-centered.

Institutional actions are calibrated using a SWOT framework:

Strengths & Weaknesses: Capitalizes on committed leadership, faculty engagement, and existing digital assets to address internal gaps in digital literacy, inconsistent infrastructure, and fragmented funding.

Opportunities & Threats: Leverages national policy support, emerging EdTech, and CHED/DOST programs to offset external risks, including cybersecurity threats, technological obsolescence, and the digital divide.

This institutional strategy aligns with the Department of Information and Communications Technology (DICT) national vision—"DICT of the People, DICT for the People"—which advances digital equity through three primary pillars:

- **Infrastructure & Connectivity:** Focuses on underserved and remote communities while expanding the country's broadband infrastructure through strategic public-private partnerships (such as the InfiniVAN MOU) under the National Broadband Program.
- **Digital Services & Adoption:** Requires multi-year alignment across government agencies through standardized Information Systems Strategic Plans (ISSP) and unifies public access through unified platforms like the eGovPH Super App.
- **Governance, Cybersecurity, and Trust:** To improve operational accountability, user trust, and investment confidence, institutional governance and cybersecurity frameworks are strengthened.

Local Government Unit (LGU) ICT roadmaps and the UNDP's Digital Bayanihan initiative, which offers free Wi-Fi and digital capacity building to remote populations, are two ways that DICT fosters inclusion at the local level.

By embedding structured evaluation and continuous adaptation into digital transformation, Pillar 5 advances three key SDGs:

- **SDG 4 (Quality Education):** Enhances instructional quality, equity, and learning outcomes through structured, data-informed program delivery.
- **SDG 9 (Industry, Innovation, and Infrastructure):** Drives innovation and builds resilient, adaptable digital learning environments.
- **SDG 16 (Peace, Justice, and Strong Institutions):** Promotes transparent, accountable, and evidence-based institutional governance.

Framework Process Flow

The operationalization of the NEDTF proceeds through a coherent, repeatable sequence:

1. Create a vision and establish a governance system through strategic planning and policy development.
2. Check digital readiness in infrastructure, curriculum, skills, and finance.
3. Improve faculty capability through structured training, mentoring, and competency tracking.
4. Strengthen infrastructure to establish a reliable and inclusive digital learning environment.
5. Secure funding and obtain partnerships to ensure sustainability.
6. Carry out the Phases of Transformation, then carry on with continuous monitoring and refinement.

Theoretical Foundations

The framework is anchored on key theoretical and regulatory models:

1. The Diffusion of Innovation Theory informs strategies for managing faculty adoption of new technologies and overcoming resistance.
2. The Technology Acceptance Model (TAM) addresses usability and perceived usefulness, informing training interventions.
3. Digital Transformation Maturity Models offer the reference stages for a step-by-step implementation process.
4. OBE and CHED CMO 15 and 19 ensure that curriculum redesign supports competency-based nursing outcomes.

5. CQI and ADDIE incorporate systematic evaluation and iteration throughout the framework.

CONCLUSION

Using the Technology–Organization–Environment (TOE) framework, the study showed that technological, organizational, and external environmental factors affect digital transformation in Philippine higher education. The COVID-19 pandemic accelerated the adoption of these technologies, making blended learning more widely used. However, these digital technologies also brought challenges such as poor internet connections, inadequate infrastructure, and limited access to digital materials.

In higher institutions, leadership and management support promote the use of digital technology. Unfortunately, limited funding, insufficient in-house training, heavy faculty workloads, and varying levels of digital skills make implementing these innovations difficult. External factors such as accreditation requirements, regulations, and resource shortages slowed adoption, and resource shortages and unequal access remained issues.

The study identified gaps in institutional support and in translating practice into practice. The Nursing Education Digital Transformation Framework (NEDTF) addresses these challenges by focusing on five areas: leadership and governance, staff digital skills, infrastructure and connectivity, financial and external support, and a step-by-step implementation process with regular monitoring and improvement.

Recommendations

Based on these findings, here are some recommendations:

1. Institutional infrastructure for digital technologies by upgrading internet access and updating digital and simulation equipment. Use a step-by-step plan to direct future infrastructure upgrades.
2. Strengthen regular faculty development through practical digital skills training rather than a single session. This should also include peer teaching and monitoring, tracking participants' development, and making digital tools mandatory as part of the teaching methodology.
3. Establish clear policies and a strategic plan for technology use that align with the organization's mission, OBE principles, CHED requirements, and accreditation bodies.
4. Increase external support and partnerships by seeking funds and technical assistance from government or private entities.

Digital transformation in nursing education requires guidelines, support, acceptance, and implementation. Incorporating all these elements improves the long-term sustainability of effective digital integration.

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