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Investigating Intrinsic Technology-Based Teaching Factors and Student Learning Satisfaction during an Emergency Distance Education Modality

Dr. Belladona A. Cortez, Mr. Vincent Bahandi, Dr. Ma. Sarah Fatima P. Valencia & Dr. Willyn G. Llera

College of Teacher Education, Negros Oriental State University, Bais City Campus

Abstract		Review Article

The COVID-19 pandemic compelled higher education institutions to adopt emergency distance education, exposing both opportunities and challenges in technology-mediated teaching and learning. This study examined how intrinsic technology-based teaching factors—technology readiness, attitude toward technology, attitude toward distance learning, and ICT self-efficacy—influence student learning satisfaction during emergency remote instruction. Using a quantitative descriptive–correlational design, data were collected from regular and part-time faculty members of a state university in Negros Oriental, Philippines. Standardized survey instruments measured educators' technological dispositions, while student teacher ratings served as indicators of learning satisfaction. Findings revealed that instructors generally demonstrated high technology readiness, positive attitudes toward ICT, and strong ICT self-efficacy, which were significantly associated with higher levels of student learning satisfaction. However, neutral attitudes toward innovative digital pedagogy and learner autonomy highlighted areas for further professional development. The study underscores the importance of strengthening teachers' intrinsic technological competencies and attitudes to foster resilient, engaging, and satisfying distance learning environments in times of educational disruption.

Keywords: Emergency distance education, Technology readiness, ICT self-efficacy, Teacher attitudes, Student learning satisfaction.

Introduction

The COVID-19 pandemic fundamentally reshaped every aspect of modern life, disrupting global health systems, economies, education, and even social interactions. Education systems worldwide—both in developed and developing nations—were forced to adapt rapidly to ensure continuity of learning despite widespread lockdowns and physical distancing restrictions. This shift gave rise to emergency remote education, where traditional face-to-face instruction was swiftly replaced with technology-mediated learning modalities designed to sustain access,

flexibility, and safety for both students and teachers (Bozkurt & Sharma, 2020; Hodges et al., 2020).

The sudden transition revealed not only the promise but also the fragility of educational systems in times of crisis. Teachers and students alike faced challenges associated with limited infrastructure, digital inequities, and varying levels of technology readiness. The success of remote education was largely determined by the preparedness of both teachers and learners—specifically their access to digital tools, their attitudes toward technology, and their overall technological competence (Almahasees et al., 2021; Chen et al., 2023). Institutions that had previously invested in digital transformation were more resilient, while those that had not were left scrambling to bridge technological and pedagogical gaps.

Among the many factors influencing effective distance learning, teacher self-efficacy emerged as a central construct. Research during and after the pandemic shows that teachers' belief in their ability to integrate and manage technology strongly predicts their engagement and instructional effectiveness (König et al., 2021; Mohd Rafee et al., 2022). Self-efficacy is also associated with greater willingness to experiment with digital pedagogies, higher confidence in facilitating virtual classes, and stronger persistence in overcoming technical and instructional challenges. Consequently, teachers' intrinsic motivation—comprising their attitudes, perceptions, and personal goals toward educational technology—plays a decisive role in shaping learning outcomes (Alqurashi, 2022).

Moreover, the pandemic highlighted the need for technology-based teaching competence, particularly the ability of educators to design adaptive, engaging, and student-centered learning experiences online. Teachers, as primary architects of learning, must now not only be pedagogically skilled but also technologically confident, innovative, and flexible. Their technology readiness—defined as the willingness to embrace and use new technologies for professional goals (Parasuraman, 2000)—significantly affects how students experience and evaluate online learning (Martin et al., 2023; Zawacki-Richter et al., 2022). When educators exhibit high levels of readiness and self-efficacy, they foster greater student satisfaction, participation, and perceived learning in distance education environments (Ye et al., 2022).

Guided by these perspectives, the present study investigates how intrinsic technology-based teaching factors—specifically teachers' attitude toward ICT, attitude toward distance learning, technology readiness, and ICT self-efficacy—influence student learning satisfaction during emergency distance education. By analyzing these interrelated constructs, this research aims to provide empirical insights into how teacher-centered technological competencies and attitudes contribute to effective, resilient, and satisfying remote learning experiences for students.

Review of Related Literature

Distance Learning and Technology Integration

Distance learning, broadly defined as the use of technology to bridge the physical distance between teachers and learners, has evolved from correspondence education in the nineteenth century to digitally mediated instruction in the twenty-first. Modern distance education leverages digital tools, internet platforms, and learning management systems (LMS) to ensure continuity of learning beyond the traditional classroom. The COVID-19 pandemic accelerated this evolution, transforming distance learning from a supplementary mode into a primary educational delivery system (Bozkurt & Sharma, 2020; Hodges et al., 2020).

While distance education offers flexibility and accessibility, its implementation often falls short of expectations due to disparities in technological infrastructure, limited digital skills, and varying levels of institutional readiness (Aristovnik et al., 2020; Coman et al., 2020). Many higher education institutions (HEIs) responded to pandemic disruptions by utilizing existing systems—such as Google Classroom, Moodle, and social media platforms—to deliver instruction remotely. However, the transition also magnified existing inequalities among students, particularly those from rural and low-income areas lacking access to stable internet or technological devices (Castañeda et al.,

2022; Rasmitadila et al., 2021). As such, the success of remote education depends not only on access to technology but also on teacher preparedness, student motivation, and institutional support structures (Almahasees et al., 2021; Tang et al., 2022).

Grounded in Attribution Theory, this study views teaching behaviors as influenced by perceived causes of success or failure—whether intrinsic (personal competence and motivation) or extrinsic (technological or environmental constraints). Understanding how educators attribute their success in online teaching helps identify what intrinsic factors—such as readiness, attitude, and efficacy—drive student satisfaction and learning outcomes.

Technology Readiness

Technology readiness refers to an individual's propensity to embrace and effectively use new technologies (Parasuraman, 2000). It encompasses four dimensions: optimism, innovativeness, discomfort, and insecurity. Educators with high levels of optimism and innovativeness are more likely to adopt digital tools and experiment with technology-enhanced pedagogy (Martin et al., 2019). In contrast, discomfort and insecurity hinder technology adoption, particularly among those with limited exposure or institutional support.

Recent studies show that teacher readiness directly predicts successful online instruction and student engagement (König et al., 2021; Chen et al., 2023). In higher education, technology readiness extends beyond digital skills—it includes psychological readiness, willingness to adapt, and institutional trust in digital platforms (Hung et al., 2020). Teachers who perceive themselves as technologically prepared tend to have higher satisfaction levels and are more confident in their ability to create engaging online learning experiences (Zawacki-Richter et al., 2022).

In the post-pandemic era, faculty technology readiness is no longer an option but a necessity. Continuous professional development, access to digital resources, and institutional support have been identified as critical enablers for effective technology integration in teaching (Alqurashi, 2022; Ye et al., 2022).

Attitude toward the Use of Technology

Attitudes toward technology significantly shape how educators integrate digital tools into their teaching practices. Teachers' perceptions, beliefs, and expectations influence whether they perceive technology as empowering or burdensome (Teo et al., 2021). Positive attitudes have been linked to increased instructional creativity, student collaboration, and classroom engagement (Ghavifekr & Rosdy, 2023).

The pandemic revealed that even seasoned educators experienced varying levels of "technological anxiety" or resistance when adapting to digital platforms. Yet, training and exposure consistently improve confidence and promote favorable attitudes toward educational technology (Almaiah et al., 2022). In a large-scale study among university instructors, faculty who engaged in technology-enhanced professional learning reported more enthusiasm toward digital pedagogy and were more likely to sustain its use post-pandemic (Huang et al., 2021).

In contrast, a lack of institutional encouragement or inadequate digital infrastructure can foster negative attitudes, limiting technology adoption (Kumar et al., 2023). Hence, institutions must create a supportive culture of innovation—where experimentation with new tools is encouraged, and teachers are empowered to take ownership of their digital teaching practices.

Attitude toward Distance Learning

Distance learning attitudes encompass perceptions of flexibility, interaction, and pedagogical value. While remote education promotes accessibility, students and teachers often differ in how they perceive its effectiveness (Bradley et al., 2015; Reinhold et al., 2021). Recent evidence suggests that teacher attitudes toward online instruction are shaped by their perceived control, workload, and perceived usefulness of technology (Carter et al., 2021; Mohd Rafee et al., 2022).

For many educators, the shift to online modalities represented both a threat and an opportunity (Gorozidis & Papaioannou, 2011). Those who viewed the change as a professional challenge

reported higher motivation, competence, and adaptability (Reinhold et al., 2021). Others, perceiving it as a threat, experienced fatigue and lowered teaching satisfaction. According to König et al. (2021), teachers' willingness to innovate and engage with learners online is a strong predictor of student satisfaction and learning effectiveness.

As institutions continue to employ hybrid and flexible learning models, cultivating positive faculty attitudes toward distance education remains central. Universities must not only provide technical training but also address emotional readiness, digital well-being, and teacher-student connectedness (Raza et al., 2023).

Teaching Self-Efficacy and ICT Competence

Self-efficacy, rooted in Bandura's (1995) social cognitive theory, refers to individuals' beliefs in their capabilities to perform specific tasks. In teaching, self-efficacy determines how educators approach challenges, persist through difficulties, and influence student learning (Bandura, 2004). During the pandemic, teaching self-efficacy became one of the most important psychological determinants of instructional success (Dolighan & Owen, 2021).

Recent research confirms that high self-efficacy among teachers correlates with greater technological adaptability, innovative instructional design, and learner engagement (König et al., 2021; Mohd Rafee et al., 2022). Teachers who underwent online professional development exhibited stronger self-efficacy in managing virtual classrooms and integrating LMS platforms effectively (Cardullo et al., 2021). Similarly, ICT self-efficacy—teachers' confidence in using digital tools—significantly predicts teaching satisfaction and technology acceptance (Ye et al., 2022).

Moreover, self-efficacy enhances teachers' resilience amid uncertainty. Studies by König et al. (2021) and Sari et al. (2023) indicate that educators with strong self-beliefs demonstrated higher instructional quality, despite technological or contextual barriers. This supports the premise that intrinsic confidence and digital competence are critical drivers of successful remote teaching and student learning satisfaction.

Synthesis

The reviewed studies converge on the understanding that intrinsic factors—namely, technology readiness, positive attitudes toward ICT and distance learning, and high self-efficacy—collectively shape effective teaching and student satisfaction in online environments. While external support such as infrastructure and policy remains important, it is teachers' internal technological dispositions that determine how effectively they transform educational challenges into opportunities. These findings directly align with the present study's objective: to examine how these intrinsic technology-based teaching factors influence student satisfaction during emergency distance education.
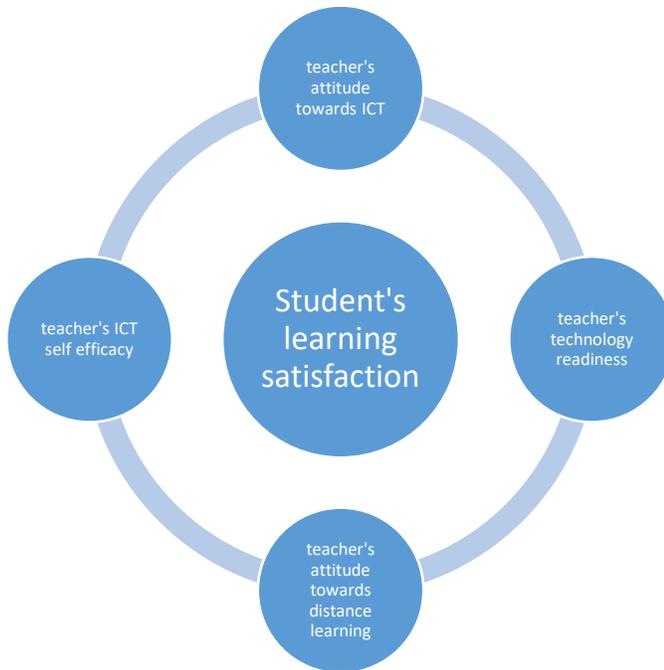
Figure 1. The research model that explains how technology readiness, attitude toward technology, attitude toward distance learning, and ICT self-efficacy affect student learning satisfaction in the mode of distance learning.

Significance of the Study (Enhanced and Polished)

This study holds substantial academic and practical importance, particularly in the context of the global shift toward emergency distance education prompted by crises such as the COVID-19 pandemic. As education systems continue to navigate post-pandemic realities, the findings of this research provide evidence-based insights that can help various stakeholders strengthen instructional resilience, technological preparedness, and student satisfaction in future learning disruptions.

Teachers

The study's findings will deepen teachers' understanding of the intrinsic factors—such as technology readiness, ICT self-efficacy, and attitudes toward digital pedagogy—that influence student learning satisfaction. By identifying these factors, educators can develop more adaptive, technology-enhanced teaching practices that promote engagement, confidence, and continuity of learning during emergency transitions. This research can also serve as a reflective framework for teachers aiming to enhance their professional competence in digital instruction.

Institutions and Policymakers

The results will serve as a basis for educational institutions and policymakers to formulate data-driven strategies that strengthen teacher training programs, improve digital infrastructure, and design supportive systems for both faculty and learners. The insights derived from this study can inform institutional policies that prioritize technological readiness and pedagogical innovation, ensuring preparedness for future educational disruptions.

Students and Parents

By identifying the intrinsic teaching and technological factors that enhance student satisfaction and engagement, this study indirectly supports students' academic performance, psychological well-being, and overall learning experience. Parents and guardians, as partners in the learning process, may also gain a clearer understanding of the conditions that foster effective

remote education, allowing them to better support learners in home-based study environments.

Future Researchers

This study contributes to the expanding body of literature on emergency remote education by specifically addressing the role of intrinsic teaching and technology-based factors in shaping learning satisfaction. It provides a conceptual and empirical foundation for future investigations on sustainable digital pedagogy, teacher resilience, and long-term integration of technology in higher education systems.

Statement of the Problem

This study aimed to determine the levels of technology readiness, attitude toward technology, attitude toward distance learning, and ICT self-efficacy among regular and part-time instructors, and how these intrinsic technology-based teaching factors influence student learning satisfaction during emergency distance education. Specifically, it sought to answer the following questions:

1. What is the profile of the regular and part-time instructors in terms of:

a. age,

b. gender,

c. highest educational attainment,

d. field of specialization, and

e. gadgets or digital devices owned?

2. What is the level of technology readiness among educators, and how is this readiness reflected in the implementation of intrinsic technology-based teaching strategies and in student learning satisfaction during emergency distance education?

3. What are the educators' attitudes toward technology, and how are these attitudes reflected in their use of technology-based teaching strategies and student learning satisfaction during emergency distance education?

4. What are the students' attitudes toward distance learning, and what are their levels of learning satisfaction during emergency distance education?

5. What is the level of educators' ICT self-efficacy, and how is it reflected in their implementation of technology-based teaching strategies and student learning satisfaction during emergency distance education?

METHODOLOGY

This research study made use of the descriptive survey method employing correlation using Pearson Product Moment Correlation. The technology readiness, attitude towards technology, attitude towards distance learning and ICT self-efficacy would be considered as intrinsic technology-based teaching factors that may affect student learning satisfaction. The students' teacher rating would be used as a measure of student learning satisfaction.

Research Design

This study employed a quantitative descriptive–correlational research design to explore the relationship between intrinsic technology-based teaching factors—specifically technology readiness, attitude toward technology, attitude toward distance learning, and ICT self-efficacy—and student learning satisfaction during emergency distance education. The descriptive method was utilized to present an accurate profile of the respondents and their characteristics, while the correlational approach was applied to determine the extent of the relationship among the identified variables. This design was appropriate as it enabled the researchers to describe current phenomena and examine associations without manipulating any variables.

Research Locale

The study was conducted at a state university located in Bais City, Negros Oriental, Philippines. Bais City is one of the five component cities in the province, strategically situated between Negros Oriental and Negros Occidental. It serves as an academic hub, housing two tertiary institutions—one government-funded and another privately managed. The city's connectivity and accessibility make it an ideal setting for studying faculty technological engagement and instructional readiness amid emergency remote teaching contexts.

Respondents of the Study

The respondents consisted of regular and part-time faculty members of the university's College of Teacher Education. They were selected based on their involvement in remote or distance learning delivery during the COVID-19 pandemic. Purposive sampling was employed to ensure that only instructors actively engaged in online or flexible learning modalities were included. Participation was voluntary, and ethical principles of informed consent, confidentiality, and anonymity were strictly observed throughout the research process.

Research Instruments

Data were gathered using four standardized survey instruments, each designed to measure the key variables of the study:

Technology Readiness — measured using the instrument developed by Mahendra Adhi Nugroho et al., which assesses respondents' optimism, innovativeness, discomfort, and insecurity toward technology use in teaching.

Attitude toward Technology — determined through the scale developed by Hernandez-Ramos et al., which evaluates educators' beliefs and behaviors regarding technology integration in instruction.

Attitude toward Distance Learning — assessed using the instrument designed by Tzivinikou et al., which examines teachers' and students' perceptions and openness toward distance learning environments.

ICT Self-Efficacy — measured using the scale by Mlambo, Rambe, and Schlebusch (2020), which evaluates educators' confidence in using and integrating information and communication technology tools in their teaching practices.

The students' teacher ratings were used as a proxy for student learning satisfaction, representing their perceived quality of instruction and engagement during the emergency distance learning period. The questionnaire also included demographic variables such as age, gender, educational attainment, field of specialization, and gadgets owned.

Data Gathering Procedure

Data collection was primarily conducted through online surveys using Google Forms, ensuring accessibility and safety during pandemic-related restrictions. When permitted, printed questionnaires were distributed during scheduled faculty meetings, with the researchers facilitating item clarification when needed. Respondents were encouraged to answer honestly, and interviews were conducted with select participants to gain deeper insights into their experiences and perceptions regarding technology-based instruction.

Data Analysis

The gathered data were analyzed using both descriptive and inferential statistical tools.

Frequency and percentage were used to describe the demographic profile of the respondents.

Weighted mean determined the respondents' levels of technology readiness, attitudes toward technology and distance learning, and ICT self-efficacy.

Pearson Product-Moment Correlation Coefficient (r) was employed to measure the degree and direction of the relationship between intrinsic technology-based teaching factors and student learning satisfaction.

The analyses were conducted using standard statistical software, and interpretations followed established conventions for correlation strength and significance levels.

Ethical Considerations

This study upheld the highest ethical standards in research. Participation was voluntary, and respondents were informed of the study's purpose and their right to withdraw at any time. All collected data were treated with strict confidentiality and used solely for academic purposes. No identifying information was disclosed in the reporting of findings.

Results and Discussion

Demographic Profile of the Respondents

Table 1.1 Age of the Respondents

Age	Frequency	Percentage
20-25	48	30.77 %
26-30	34	21.79 %
30-35	20	12.82 %
36-40	15	9.62 %
41-45	10	6.41 %
46-50	9	5.77 %
51-55	7	4.49 %
56-60	8	5.13 %
61-65	5	3.21 %
	156	

Table 1.1 presents the **age** distribution of the respondents, showing a strong representation of younger faculty members. The majority of respondents were within the 20–25 years old bracket (30.77%), followed by those aged 26–30 years (21.79%) and 31–35 years (12.82%). This indicates that a significant portion of the teaching workforce involved in emergency distance learning consisted of young educators, many of whom are early in their academic careers and more familiar with digital tools and online platforms.

The predominance of younger instructors suggests a generally higher level of technology adaptability and openness to innovation, consistent with findings by Baber (2021) and Shaqour and Khlaif (2023), who reported that younger teachers tend to demonstrate stronger digital competence and more positive attitudes toward the integration of educational technologies. Younger faculty members are often categorized as "digital natives," characterized by their familiarity with emerging technologies and comfort in digital environments (Prensky, 2001; Reinhold et al., 2021).

Conversely, the smaller proportion of respondents from older age groups, particularly those aged 51 and above (less than 15% combined), reflects a demographic less represented in technology-driven pedagogical shifts. Research indicates that senior educators may face greater challenges in adapting to new digital tools, primarily due to generational differences in training exposure and confidence levels (Cardullo et al., 2021; Adedoyin & Soykan, 2020). Nevertheless, their participation remains vital in ensuring pedagogical continuity and institutional stability.

Overall, the age profile suggests that faculty demographics play a significant role in determining technology readiness and ICT self-efficacy. The concentration of younger educators may have positively influenced the overall technology adoption rate within the institution during emergency distance education, aligning with similar observations by Mlambo, Rambe, and Schlebusch (2020) that technological competence often correlates with age and experience in online teaching contexts.

Table 1.2 Gender of the Respondents

Gender	Frequency	Percentage
Male	42	26.92 %
Female	106	67.95 %
LGBTQ	8	5.13 %

Table 1.2 presents the gender distribution of the respondents. The data reveal that a majority of the faculty participants were female (67.95%), followed by male respondents (26.92%) and a smaller proportion identifying as LGBTQ+ (5.13%). This finding reflects the continuing trend of female dominance in the teaching profession, particularly in education-related programs, where women traditionally represent a higher percentage of faculty and instructional staff (UNESCO, 2021; Gamage et al., 2022).

The gender composition in this study is consistent with global and local trends in the education sector, where teaching remains a female-dominated field, especially in the elementary and secondary levels, as well as teacher education institutions (Rizvi & Elyas, 2021). This demographic pattern has implications for professional development and technology adoption, as several studies have noted gender-based differences in technology readiness and ICT self-efficacy. For instance, Cardullo et al. (2021) found that female teachers often demonstrate high adaptability and commitment to professional development but may initially report lower self-efficacy in technology integration compared to their male counterparts. Conversely, Baber (2021) and Shaqour and Khlaif (2023) observed that gender gaps in digital competence have been narrowing, with female educators increasingly displaying confidence and competence in using educational technologies during the shift to remote learning.

Furthermore, the inclusion of LGBTQ+ respondents (5.13%) highlights growing diversity and inclusivity in the teaching workforce. Recent educational research underscores that gender diversity in academia contributes to more inclusive and equitable learning environments, particularly in discussions of digital pedagogy and learner engagement (UNESCO, 2022; Tsegay et al., 2023). Overall, the results suggest that while female educators comprise the majority of teaching personnel in the studied context, their active participation in technology-enhanced education during the pandemic underscores the profession's adaptability and commitment to inclusive, student-centered online teaching practices.

Table 1.3 Level of Study of the Respondents

Level of Study	Frequency	Percentage
Bachelor's Degree	16	10.26 %
with MA Units	61	39.10 %
Full-fledged Master's Degree	45	28.85 %
with Doctorate Units	20	12.82 %
Full-fledged Doctorate Degree	14	8.97 %

Table 1.3 presents the educational attainment of the respondents, showing that most faculty members possessed graduate-level qualifications. Specifically, 39.10% of the respondents had earned units toward a master's degree, while 28.85% had completed a full master's degree. In addition, 12.82% were pursuing

doctoral studies, and 8.97% already held a full-fledged doctorate degree. Only 10.26% of the faculty respondents held bachelor's degrees.

This distribution clearly indicates a highly educated teaching workforce, reflecting a strong institutional emphasis on academic advancement and professional growth. Such findings align with the professionalization trends in higher education, where faculty members are expected to continuously enhance their academic credentials to meet quality assurance standards and improve instructional effectiveness (OECD, 2021; UNESCO, 2022).

Moreover, higher levels of educational attainment among teachers have been positively linked to pedagogical competence, self-efficacy, and technology adoption in digital and flexible learning contexts. According to Cardullo et al. (2021) and Quiño (2021), graduate education enhances teachers' confidence in applying innovative teaching strategies and integrating technology into instruction. Educators with advanced degrees are often more

engaged in reflective practice, research-informed pedagogy, and digital innovation, all of which contribute to effective teaching in both face-to-face and remote settings (Baber, 2021; Gamage et al., 2022).

Furthermore, the presence of respondents with doctoral qualifications (approximately 21.79% combined) suggests a growing academic culture of research-oriented teaching and lifelong learning. This aligns with Tsegay et al. (2023), who emphasized that advanced education empowers teachers to become catalysts for institutional change, especially in transitioning toward inclusive and technology-enhanced education systems.

Overall, the data signify that the respondents' strong academic preparation serves as a foundation for pedagogical excellence and technological readiness—critical attributes for sustaining quality education amid the demands of emergency distance learning and post-pandemic academic transformation.

Table 1.4 Field of Specialization of the Respondents

Field of Specialization	Frequency	Percentage
Computer Science & Information Technology	14	8.97%
English	11	7.05%
Filipino	9	5.77%
Science	9	57.7%
Social Studies	20	12.82%
Mathematics	8	5.13%
Office Administration	7	4.49%
Physical Education	8	51.3%
Hospitality Management	6	3.85%
BSBA	18	11.54%
Elementary Education	8	5.13%
Secondary Education	11	7.05%
Criminology	10	6.41%
Industrial Technology	8	5.13%
Fisheries	6	3. 85%

Table 1.4 shows the distribution of respondents based on their field of specialization, revealing a diverse academic composition across disciplines.

The highest number of participants specialized in Social Studies (12.82%) and Business Administration (11.54%), followed by Computer

Science and Information Technology (8.97%), English (7.05%), and Secondary Education (7.05%). The smallest representation came from Hospitality Management and Fisheries (3.85% each), suggesting that respondents were drawn from a broad mix of academic domains, with a notable concentration in social sciences, business, and education-related fields.

This disciplinary diversity is advantageous, as it reflects the interdisciplinary nature of technology integration in higher education. According to Gamage et al. (2022) and Zhao and Watterston (2021), educators from varied academic backgrounds contribute to a richer exchange of pedagogical strategies, fostering collaboration in adapting technology-enhanced teaching practices. Fields such as Information Technology, Business, and Education are particularly relevant in developing digital literacy, online assessment design, and the implementation of learning management systems (Baber, 2021; Shaqour & Khlaif, 2023).

Furthermore, the participation of respondents from both technical disciplines (e.g., IT, Industrial Technology) and non-technical fields (e.g., English, Social Studies, and Filipino) demonstrates how technological readiness and ICT self-efficacy transcend subject matter boundaries. Studies by Tsegay et al. (2023) and Coman et al. (2020) highlight that educators from diverse academic domains can equally benefit from technology integration training, provided that institutional support and professional development programs are accessible.

In addition, the presence of faculty from teacher education programs underscores the relevance of pedagogical specialization in leading digital transitions. Teacher education units often serve as catalysts for innovation, preparing future educators to apply 21st-century skills and digital competencies in both face-to-face and remote settings (Quiño, 2021; UNESCO, 2022).

In summary, the data indicate a multidisciplinary teaching workforce, signifying the university's broad academic coverage and capacity to implement technology-based instruction across programs. This diversity supports the adaptability of the institution to flexible and emergency learning modalities, as noted by Adedoyin and Soykan (2020) in their study of global education responses to the COVID-19 pandemic.

Table 1.5 Gadgets Owned of the Respondents

Gadgets Owned	Frequency	Percentage
Desktop	16	10.26%
Laptop	40	25.64%
Tablet	11	7.05%
Smartphones	89	57.05%

Table 1.5 shows the distribution of gadgets owned by the respondents, which reflects their level of technological access and readiness for digital instruction. A majority of the respondents (57.05%) owned smartphones, making these the most common and preferred device for communication, online instruction, and access to digital content. This was followed by laptops (25.64%), while desktops (10.26%) and tablets (7.05%) were less common among the respondents.

The dominance of smartphone ownership indicates the growing reliance on mobile technology for teaching and learning, particularly during emergency distance education. Studies by Aristovnik et al. (2020) and Adedoyin and Soykan (2020) confirm that smartphones have become essential tools for

both teachers and students due to their affordability, portability, and multifunctional capabilities. They serve as practical devices for accessing virtual classrooms, communicating via learning management systems, and conducting digital assessments.

The prevalence of laptop ownership further emphasizes educators' efforts to maintain professional productivity in online environments. Laptops are often considered indispensable for formal instruction, content creation, and synchronous learning sessions (Coman et al., 2020; Baber, 2021). Meanwhile, the relatively low ownership of desktops and tablets may be attributed to mobility preferences and budget limitations, consistent with the findings of Shaqour and Khlaif (2023), who noted that post-pandemic educators tend to favor portable devices that support flexible teaching and blended modalities.

These findings suggest that while educators demonstrate high technology readiness through personal ownership of digital devices, the reliance on smartphones as the primary teaching tool also underscores the digital divide in terms of access to more sophisticated hardware. As Gamage et al. (2022) and Tsegay et al. (2023) point out, the type and quality of available gadgets significantly influence teachers' ability to deliver engaging, technology-enhanced learning experiences. Hence, institutional support for digital infrastructure and faculty training remains essential to ensure equitable access and optimize the use of digital technologies for education.

Table 2 Technology Readiness

	Weighted Mean	Verbal Description
I presently intend to use the technology regularly in teaching and learning process in the future.	3.97	Agree
I will recommend others to use the technology to support learning process.	4.49	Strongly Agree
I prefer use technology in the teaching and learning process.	3.88	Agree
Technology makes my work become efficient.	4.41	Strongly Agree
New technologies contribute to a better quality of life.	4.35	Strongly Agree
I enjoy the technology gadgets.	4.57	Strongly Agree
I keep up with latest technological developments in my areas of interest.	3.49	Agree
There should be caution in replacing important people tasks with technology because new technology is not dependable.	4.05	Agree
It is embarrassing when I have trouble with a high-tech gadget while others are watching.	2.54	Disagree

Technology lowers the quality of relationship by reducing personal interaction.	4.40	Strongly Agree
I am worry that information I make available over the Internet maybe misused by others.	4.21	Strongly Agree
I do not consider it safe to do any kind of teaching and learning process by using the technology.	3.21	Neutral

Table 2 presents the technology readiness of educators, revealing that respondents generally exhibited a high level of technological confidence and acceptance. The data indicate strong agreement that technology improves work efficiency (WM = 4.41), enhances quality of life (WM = 4.35), and is enjoyable to use (WM = 4.57). Respondents also expressed enthusiasm for promoting technology use among peers (WM = 4.49) and integrating it into their teaching practice (WM = 3.88).

This aligns with the findings of Baber (2021) and Shaqour and Khlaif (2023), who found that teachers with high technology readiness are more likely to integrate digital tools into instruction effectively. Their positive attitudes reflect not only adaptability but also an intrinsic motivation to engage with emerging educational technologies—an essential trait in post-pandemic pedagogical environments (Tsegay et al., 2023).

Despite overall readiness, respondents demonstrated measured caution. They agreed that technology may reduce personal interaction (WM = 4.40) and expressed concern about privacy and data security (WM = 4.21). These concerns echo studies by Gonzales et al. (2022) and Olapiriyakul and Jittsue (2023), which highlight the tension between technological adoption and the human dimensions of teaching. Educators value the convenience of digital tools but remain wary of the potential erosion of relational aspects of learning and ethical risks in data handling.

The neutral stance regarding the safety of fully relying on technology (WM = 3.21) suggests that while teachers are confident in using technology, they still recognize infrastructure limitations, such as connectivity issues and cybersecurity vulnerabilities (Aristovnik et al., 2020; Al-Samarraie et al., 2021). Moreover, the low mean on embarrassment with gadgets (WM = 2.54) indicates growing digital resilience and self-efficacy among teachers, consistent with Cardullo et al. (2021) who reported that faculty who frequently engage in online teaching exhibit greater technological confidence and reduced anxiety toward errors.

Overall, the data suggest that the respondents are technologically capable, optimistic, and proactive in their approach to educational technology, while maintaining critical awareness of the ethical and interpersonal challenges that accompany digital transformation in education. This balance of enthusiasm and caution embodies the evolving character of teachers in the post-pandemic digital learning landscape—adaptable, reflective, and committed to responsible innovation.

Table 3 Teacher's Attitude towards Technology

	Weighted Mean	Verbal Description
Teachers show technology improved their ability to provide	4.15	Agree

course contents in a more dynamic and engaging way.		
Teachers show that technology improved their classroom management by providing tools for monitoring and engaging students.	3.12	Neutral
Teachers are always excited about the creative teaching methods that technology allows, such as flipped classes and blended learning.	3.24	Neutral
Teachers show appreciation in the ease of sharing resources and collaborate with their co-teachers via online platforms and forums.	3.80	Agree
Teachers show appreciation in the professional development opportunities provided by online courses and webinars to stay current on latest educational technologies and approaches.	4.05	Agree

Table 3 presents the teachers' attitudes toward technology, revealing generally positive perceptions toward the use of digital tools in education. Respondents agreed that technology has enhanced their ability to deliver course content more dynamically (WM = 4.15) and that it facilitates collaboration and professional development (WM = 3.80–4.05). These findings indicate that teachers view technology as a valuable aid to instructional improvement and lifelong learning, reflecting the post-pandemic emphasis on continuous digital upskilling in higher education (Baber, 2021; Tsegay et al., 2023).

Teachers' appreciation for online training and resource-sharing aligns with the findings of Trust et al. (2020) and Carrillo and Flores (2020), who observed that online professional communities and webinars have become essential avenues for educators to exchange best practices, especially in flexible and blended learning environments. The relatively high mean for professional development (WM = 4.05) underscores teachers' recognition of digital literacy as a professional competency,

consistent with UNESCO's (2022) call for educators to be lifelong learners in an increasingly technology-driven educational landscape.

However, teachers expressed neutral attitudes regarding the use of technology for classroom management (WM = 3.12) and enthusiasm for innovative pedagogies such as flipped and blended learning (WM = 3.24). This may indicate limited exposure, lack of confidence, or insufficient institutional support in fully implementing technology-enhanced pedagogies (Alemany-Arrebola et al., 2020; Shaqour & Khlaif, 2023). Such findings echo the challenges noted by Olapiriyakul and Jittsue (2023), who emphasized that while educators acknowledge the potential of educational technology, consistent training and institutional encouragement are vital to move from passive adoption to transformative integration.

In general, the results reveal that teachers possess favorable attitudes toward technology and recognize its value in enhancing instruction and professional growth. However, their neutral stance on creative teaching integration suggests a transitional stage —

from using technology as a supplementary tool to adopting it as a core element of innovative pedagogy. This aligns with the broader movement toward developing digitally competent educators capable of fostering interactive, engaging, and student-centered learning experiences in both physical and virtual classrooms (Gonzales et al., 2022; Gamage et al., 2022).

Table 4 Student's Attitude towards Distance Learning

	Weighted Mean	Verbal Description
Distance Education is flexible.	3.87	Agree
Distance Education uses educational technology at a wide range	4.08	Agree
Distance Education enhances the learner's motivation.	2.73	Neutral
Distance Education offers a good opportunity to the learner to choose the major, the time and the way of studying	2.97	Neutral
Distance Education employs modern technology that attracts learner's attention.	3.43	Agree
Distance Education overcomes geographical distances.	3.96	Agree
Distance Education offers specialized knowledge and skills.	3.09	Neutral

Table 4 presents the students' attitudes toward distance learning, showing generally positive perceptions toward its flexibility, accessibility, and technological integration. Respondents agreed that distance education is flexible (WM = 3.87), widely utilizes educational technology (WM = 4.08), overcomes geographical barriers (WM = 3.96), and employs modern tools that sustain attention (WM = 3.43). These findings affirm that students recognize distance learning as a viable and adaptive modality that supports continued education during emergencies and beyond (Adedoyin & Soykan, 2020; Bao, 2020). The results align with the findings of Khan et al. (2022) and Almahasees and Jaccomard (2023), who observed that the flexibility and accessibility of online learning allow students to balance personal, academic, and professional responsibilities, thus enhancing participation and inclusivity. Likewise, Martin et al. (2022) emphasized that exposure to a wide range of educational technologies enhances students' engagement and autonomy, making distance education a sustainable component of post-pandemic higher education.

However, the respondents' neutral perceptions on motivation (WM = 2.73), autonomy in learning choices (WM = 2.97), and access to specialized knowledge (WM = 3.09) indicate underlying challenges in learner engagement and depth of content. Research during and after the COVID-19 pandemic shows that while students appreciate the convenience of distance education, many struggle with motivation, self-regulation, and a sense of academic belonging (Baber, 2021; Mahyoob, 2021).

Moreover, Tomasik et al. (2021) and Reyna (2023) highlighted that digital learning environments, without adequate instructional design and teacher presence, may lead to decreased satisfaction and motivation despite technological richness.

These findings underscore the importance of fostering interactive, personalized, and supportive online learning ecosystems. Universities and educators must balance technological integration with pedagogical strategies that enhance learner motivation, collaboration, and feedback mechanisms (Rapanta et al., 2021; Adarkwah, 2021). When implemented effectively, distance learning can evolve from a crisis-response modality to a transformative educational framework promoting flexibility, engagement, and skill development (Hodges et al., 2020; Upoalkpajor & Upoalkpajor, 2020).

In summary, students' attitudes reflect conditional optimism toward distance learning—they value its flexibility and technological opportunities but express concerns about its motivational and human dimensions. This suggests that post-pandemic education must move beyond technology adoption toward pedagogical innovation and human-centered digital design to achieve meaningful learning satisfaction (Bozkurt & Sharma, 2023).

Table 5 ICT's Self-Efficacy

	Weighted Mean	Verbal Description
I feel confident that I have the necessary skills to use instructional technology (such as IWB or eBoards, tablet PCs and educational Apps, drill and practice software, online media, simulation software, etc.) for instruction.	3.61	Agree
I feel confident that I can help learners when they have difficulty with instructional technology.	3.42	Agree
It is easy for me to find instructional technologies that are relevant to my teaching.	4.35	Strongly Agree
I can design technology-based classroom activities in my classroom in a way that my learners can learn by themselves under my guidance.	3.27	Neutral
I can easily teach classes in which I am required to use instructional technology.	4.13	Agree

I can learn to use computers for my teaching and learning process.	4.53	Strongly Agree

Table 5 presents teachers' self-efficacy in using information and communication technology (ICT) for instruction. The overall results reveal a high level of ICT self-efficacy, as most of the items yielded mean scores within the "Agree" to "Strongly Agree" range. Teachers expressed strong confidence in their ability to learn new digital tools (WM = 4.53) and to identify technologies relevant to their instruction (WM = 4.35). These findings suggest that educators are becoming increasingly adept and proactive in adopting digital platforms for teaching and learning—a trend that accelerated during and after the COVID-19 pandemic (Tondeur et al., 2021; Ghavifekr & Rosdy, 2022).

The results further indicate that teachers are confident users of instructional technologies (WM = 3.61) and feel capable of assisting learners with technical difficulties (WM = 3.42). This aligns with findings by Schmid et al. (2021) and Mahmood (2023), who reported that teachers' self-efficacy significantly influences their ability to integrate technology effectively, respond to students' needs, and sustain engagement in virtual classrooms. Moreover, high self-efficacy levels have been associated with increased willingness to experiment with new educational tools and methods (Yildiz Durak, 2022).

However, respondents showed neutral confidence (WM = 3.27) in designing technology-based activities that promote learner autonomy. This finding highlights an ongoing challenge in shifting from teacher-centered to learner-centered digital pedagogy. As noted by Reyna (2023) and Rapanta et al. (2021), teachers often excel in using digital tools but may require additional training in instructional design, scaffolding, and online facilitation to ensure students can effectively self-direct their learning in digital environments.

In summary, the data indicate that while teachers are confident in using and exploring ICT for teaching,

they still need continuous professional development in areas related to technology-enhanced learning design, pedagogical innovation, and learner autonomy. Strengthening these aspects could enhance both instructional quality and student satisfaction, particularly in hybrid and distance learning contexts (Durak et al., 2023; UNESCO, 2022).

Conclusion

The findings of this study reveal that the majority of respondents were young adults aged 20–30, predominantly female, and either currently pursuing or holding graduate-level degrees. Their diverse academic backgrounds—primarily within the social sciences and business disciplines—reflect a well-educated and multidisciplinary teaching force. The widespread ownership of smartphones and laptops underscores their strong digital access and mobility, a key factor enabling participation in technology-enhanced learning environments.

Overall, respondents demonstrated a high level of technology readiness and enthusiasm toward integrating digital tools into teaching and learning. They strongly agreed that technology increases work efficiency, enhances quality of life, and provides enjoyment in professional practice. Nonetheless, they expressed caution regarding the potential downsides of technology use, particularly concerns about reduced interpersonal interaction, information security, and overreliance on digital systems. This balanced perspective reflects both optimism and critical awareness in adapting to digital transformation in education.

Teachers generally held positive attitudes toward the use of technology, recognizing its benefits in enhancing content delivery, collaboration, and opportunities for continuous professional development. However, their neutral stance on the use of technology for classroom management and

innovative pedagogies such as blended and flipped learning suggests gaps in training, support, or practical experience. This indicates a need for sustained institutional programs focused on pedagogical innovation and digital classroom management.

Students exhibited an overall positive attitude toward distance learning, valuing its flexibility, accessibility, and capacity to transcend geographical boundaries. Yet, their neutral perceptions regarding motivation, autonomy, and specialized skill development indicate that while online learning provides convenience, it may fall short in promoting sustained engagement and deep learning without adequate instructional design and teacher presence.

Furthermore, teachers reported strong self-efficacy in using and adapting to ICT tools, expressing confidence in teaching technology-enhanced lessons and assisting students in digital learning. However, their moderate confidence in designing self-directed, technology-based learning activities points to a developmental need for enhanced training in learner-centered and inquiry-driven digital pedagogy.

In conclusion, both teachers and students have demonstrated readiness and adaptability in embracing technology-mediated education. Nevertheless, the findings emphasize the importance of strategic professional development, institutional support, and pedagogically grounded ICT integration to ensure that technology not only enhances efficiency but also fosters engagement, motivation, and meaningful learning outcomes in a sustainable digital education ecosystem.

Recommendations

Based on the findings of this study, several key recommendations are proposed to strengthen the integration of technology in teaching and learning, enhance educators' professional competencies, and improve students' distance learning experiences.

First, it is strongly recommended that educational institutions design and implement comprehensive, continuous professional development (CPD) programs that enhance teachers' competence in integrating technology effectively into pedagogical practices. These training initiatives should move beyond basic tool utilization to include advanced applications such as digital classroom management, blended learning, and flipped classroom design. Structured workshops, peer mentoring, and collaborative planning sessions can foster creativity, adaptability, and pedagogical innovation among teachers, empowering them to design learner-centered, technology-enriched environments.

Second, schools and universities should address students' mixed perceptions of distance learning by developing strategies to enhance motivation, engagement, and self-regulation. Personalized learning experiences, interactive modules, and flexible course structures can help students maintain active participation. Additionally, integrating feedback loops, online academic advising, and virtual peer support systems can strengthen students' sense of belonging and connection in remote settings, thereby promoting more meaningful engagement and satisfaction.

Third, recognizing that the majority of respondents primarily rely on mobile devices, educational content and platforms should be optimized for mobile learning (m-learning). Learning management systems, applications, and multimedia resources should be responsive, user-friendly, and accessible across various devices. Ensuring mobile compatibility enhances equity in access to education, particularly for learners with limited access to desktop computers.

Fourth, given the respondents' expressed concerns regarding data privacy, reduced interpersonal interaction, and digital dependence, institutions should incorporate digital citizenship and cyber ethics education into professional development and student orientation programs. Training on responsible data management, online professionalism, and strategies to sustain interpersonal relationships in virtual settings is essential to promoting ethical and socially conscious technology use.

Finally, academic leaders should foster a culture of lifelong learning by encouraging faculty to remain up-to-date with emerging educational technologies and digital pedagogies. Access to webinars, MOOCs, professional learning communities, and innovation

hubs should be institutionalized to support continuous professional growth. Through these avenues, teachers can sustain their technological fluency and responsiveness to the dynamic demands of 21st-century education.

By addressing both the strengths and developmental areas identified in this study, educational institutions can build a resilient, inclusive, and future-ready academic ecosystem that not only leverages technology for efficiency but also ensures engagement, equity, and excellence in teaching and learning.

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