



Faculty Digital Competence and Institutional Challenges to Criminology Instructional Competence Across Campuses in Cabanatuan City

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Abstract- This study examines faculty digital competence and institutional challenges affecting instructional competence in criminology education across campuses in Cabanatuan City. As higher education institutions increasingly integrate digital technologies into teaching and learning, criminology faculty members are expected to demonstrate proficiency in digital tools, online learning platforms, digital instructional materials, and technology-enhanced teaching strategies. However, differences in digital skills, access to technological resources, institutional support, internet connectivity, and professional development opportunities may influence the effective delivery of criminology instruction. The study aims to assess the level of faculty digital competence, identify the institutional challenges encountered in integrating digital technologies into instruction, and determine how these factors relate to instructional competence among criminology faculty members. It also seeks to examine the availability of technological infrastructure, technical assistance, and training programs that support digital teaching practices. A descriptive-correlational research design may be employed, using a structured survey questionnaire administered to criminology faculty members from selected higher education institutions in Cabanatuan City. Appropriate statistical tools may be used to analyze the respondents' profiles, levels of digital competence, perceived institutional challenges, and instructional competence, as well as the relationships among the study variables. The findings are expected to provide a basis for developing recommendations and institutional strategies that strengthen faculty digital capabilities, improve technology-supported instructional practices, and enhance the quality of criminology education across campuses. Ultimately, the study may contribute to more effective, accessible, and responsive teaching and learning experiences in criminology programs.

Keywords: Faculty Digital Competence, Institutional Challenges, Instructional Competence, Criminology Education, Digital Learning, Higher Education, Cabanatuan City

I. Introduction

The Problem and its Background

The digitalization of instruction in Criminology extends beyond the mere availability of technological resources; it was closely linked to the digital competence of faculty members who serve as the primary agents of instructional delivery. Faculty digital competence encompasses the ability to effectively use digital tools for teaching, assessment, research, and professional engagement. In the context of Criminology, this includes proficiency in learning management systems, virtual simulations, crime data analysis platforms, digital evidence handling, and cybercrime investigation tools. Without adequate digital competence, even well-designed curricula and advanced technologies may fail to achieve their intended educational outcomes.

Across campuses in Cabanatuan City, disparities in faculty preparedness for digital instruction may influence the quality and consistency of learning experiences among Criminology students. Some faculty members may possess strong academic and field



expertise but have limited exposure to emerging instructional technologies due to lack of institutional support.

This condition may lead to continued reliance on traditional lecture-based teaching methods, which may not fully address the practical and technological demands of contemporary criminological practice. Consequently, a gap may emerge between the competencies expected of graduates under national standards and the skills actually developed within the classroom.

Institutional challenges further compound these concerns. The effective integration of digital tools in instruction requires not only skilled faculty but also supportive institutional structures. These include adequate ICT infrastructure, reliable internet connectivity, access to licensed software, technical support services, and clear policies that encourage innovation in teaching. In some campuses within Cabanatuan City, limitations in budget allocation, administrative prioritization, and long-term planning may hinder the sustained implementation of digital initiatives. Such constraints may result in uneven adoption of technology across institutions, thereby affecting instructional quality and academic outcomes.

The urgency of addressing these issues was heightened by the evolving nature of crime and law enforcement in the digital era. The increasing prevalence of cybercrime, online fraud, and technology-assisted criminal activities necessitates that Criminology graduates possess not only theoretical knowledge but also practical digital competencies. Institutions that were unable to adapt their instructional approaches risk producing graduates who were ill-prepared for the technological demands of modern policing and criminal justice systems. Given these considerations, a systematic examination of faculty digital competence and institutional challenges in Criminology instructional competence across campuses in Cabanatuan City was both timely and necessary. By identifying existing gaps and constraints, this study seeks to contribute to the development of evidence-based strategies that can enhance instructional practices, inform institutional decision-making, and support policy implementation. Ultimately, the findings of this research may serve as a foundation for strengthening Criminology education in Cabanatuan City, ensuring that it remains responsive, equitable, and aligned with the evolving demands of the criminal justice profession.

Theoretical Framework

This study was anchored on the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006). The TPACK framework emphasizes that effective teaching with technology requires the seamless integration of three core knowledge domains: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK).

Content Knowledge (CK) refers to an educator's mastery of specific criminology subjects, such as cybercrime, digital forensics, and crime analysis. A deep understanding of this domain was critical, as instructors must possess the substantive expertise required to accurately break down complex legal, theoretical, and investigative concepts, ensuring that the information delivered to students was both current and factually sound. Pedagogical Knowledge (PK) encompasses a teacher's understanding of instructional methods and student learning processes. This knowledge was essential because subject-matter expertise alone was not enough; educators must also know how to translate that expertise by designing effective lesson plans, assessing student comprehension, and applying appropriate teaching strategies that cater to diverse learning styles. Finally, Technological Knowledge (TK) involves the ability to effectively utilize digital tools in the educational environment. In the modern criminology classroom, this means going beyond basic



computer literacy to thoughtfully integrate specialized investigative software, virtual crime scene simulations, and interactive online platforms in ways that actively enhance and deepen the overall learning experience.

The intersection of these domains represents faculty competence in integrating technology into instruction, which was critical for the digitalization of criminology programs. The TPACK framework supports this study by highlighting the importance of digital competence, institutional support, and training exposure in achieving effective technology integration.

Conceptual Framework

This study was anchored on an Independent Variable–Dependent Variable (IV–DV) conceptual framework designed to evaluate the internal and external determinants of teaching excellence in Criminology higher education. The model posits that Criminology Instructional Competence (Dependent Variable) was shaped by the interplay between individual-level technical capabilities, operationalized as Faculty Digital Competence (Independent Variable 1), and environmental organizational conditions, operationalized as Institutional Challenges (Independent Variable 2).

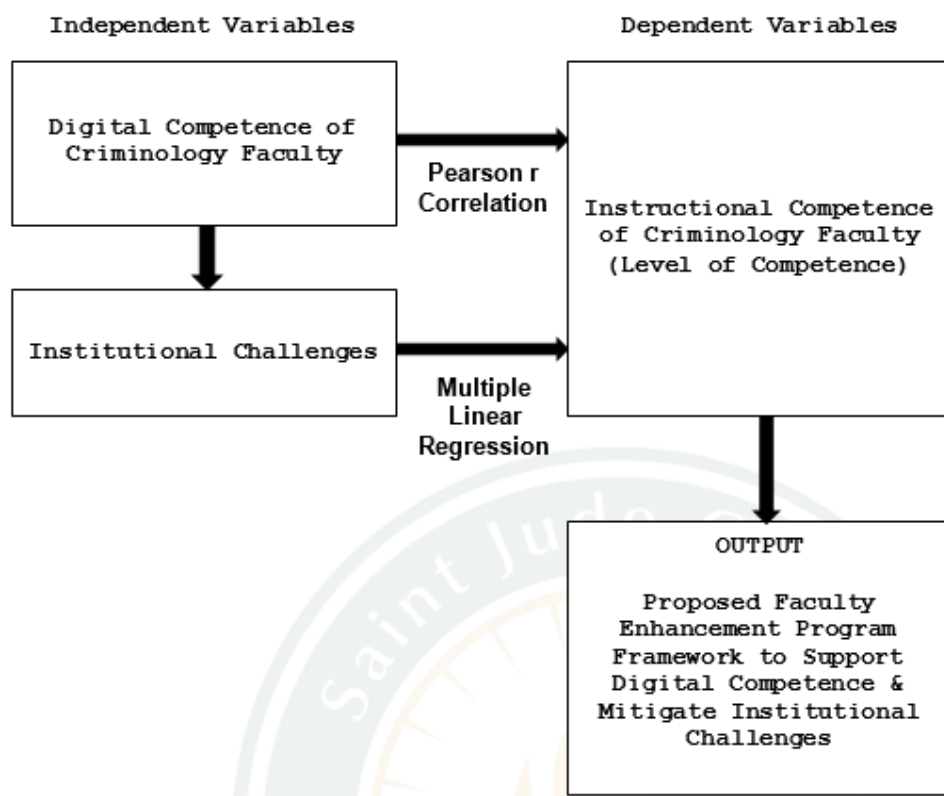


Figure 1. The Conceptual Paradigm

The conceptual paradigm of this study illustrates the systematic flow and logical relationships among the primary variables, linking empirical assessment directly to an actionable institutional intervention. Positioned as the independent variables were the digital competence of Criminology faculty and the institutional challenges they face. Digital competence evaluates the educators' technical capabilities, digital literacy, and proficiency in integrating modern educational technology into instruction. Conversely, institutional challenges represent organizational constraints, infrastructure limitations, resource



availability, and administrative support systems that impact the teaching environment. These predictor variables were posited to influence the dependent variable, which was the instructional competence of Criminology faculty, encompassing their pedagogical effectiveness, curriculum delivery, classroom management, and assessment strategies.

The relationship and predictive dynamics between these variables were evaluated through two distinct statistical treatments. First, a Pearson r correlation analysis tests whether a statistically significant relationship exists between faculty digital competence and instructional competence, establishing whether higher digital literacy directly corresponds to improved teaching performance. Second, a multiple linear regression analysis measures the extent to which digital competence and institutional challenges, acting concurrently as predictor variables, significantly determine instructional competence. This statistical treatment isolates the relative contribution and combined impact of both individual digital skills and broader organizational factors in shaping Criminology teaching performance. Ultimately, the empirical results derived from these baseline measures and statistical analyses serve as the direct foundation for the study's terminal output. Based on the identified strengths, competency gaps, and institutional hurdles, the study formulates a proposed Criminology Faculty Enhancement Program Framework. This framework was specifically structured to provide targeted interventions that upskill faculty in digital teaching methodologies while offering actionable strategies to mitigate institutional barriers. Through this systematic approach, the output aims to bridge technological and structural gaps, thereby enhancing the overall quality and delivery of Criminology education.

Statement of the Problem

This study aims to examine the faculty's digital competence and institutional challenges to criminology instructional competence across campuses in Cabanatuan City, Nueva Ecija.

Specifically, it seeks to answer the following research questions:

- What is the level of digital competence of the Criminology faculty?
- What is the level of institutional challenges?
- What is the level of Criminology faculty instructional competence?
- Is there a significant relationship between digital competence and criminology instructional competence?
- Do faculty digital competence and institutional challenges significantly predict criminology instructional competence?
- Based on the findings of the study, what enhancement program framework may be proposed to support faculty digital competence and mitigate institutional challenges in Criminology instruction?

Hypothesis

The following null hypothesis was tested at a 0.05 level of significance:

- $H_{(o1)}$: There is no significant relationship between the digital competence and the instructional competence of Criminology faculty.
- $H_{(o2)}$: Digital competence and institutional challenges do not significantly predict, individually or jointly, the instructional competence of Criminology faculty.

Scope and Limitations/Delimitations of the Study

This study focuses on faculty members teaching Criminology programs in campuses located in Cabanatuan City, Nueva Ecija. It examines faculty digital competence, institutional challenges, and instructional competence. The study examines digital competence in terms of the use of productivity tools and troubleshooting technical issues. The study also considers instructional competence, particularly the faculty members' ability to integrate appropriate digital technologies into lesson preparation, instructional delivery,



classroom activities, assessment, and other teaching related tasks. The study also analyzes institutional challenges such as the availability of ICT infrastructure, access to digital tools, and opportunities for professional development. Furthermore, it explores the relationship between faculty digital competence and their exposure to training programs on digital tools. The respondents of the study were limited to faculty members with at least one (1) year of teaching experience, as they were more likely to have practical exposure to the integration of technology in Criminology instruction. The study does not cover students or faculty from other disciplines, nor does it evaluate the effectiveness of specific digital tools or platforms in teaching. Its focus was limited to the perceptions and self-reported competence of faculty members regarding their digital skills and institutional challenges. The study was conducted and completed by the third quarter of the year 2026.

Significance of the Study

The results of this study benefits the following:

- Faculty Members. This study will help faculty members identify areas for improvement in their digital skills and increase awareness of available training opportunities to enhance technology-based instruction.
- Criminology Institutions. This study will help faculty members identify areas for improvement in their digital skills and increase awareness of available training opportunities to enhance technology-based instruction.
- CHED and Education Stakeholders. The study provides insights into challenges faced by criminology programs in provincial settings, which may inform policy development and support initiatives for technology integration.
- Future Researchers. The conducted studies will further open doors for future researchers to refine and expand studies in relation to faculty digital competence, institutional challenges, and the integration of technology in higher education.

Definition of Terms

To facilitate understanding of this study, the following terms were defined herein.

- Access to Digital Resources. Measured by faculty perception of the availability and ease of use of digital content, e-learning materials, and online teaching aids.
- Criminology Faculty. Refers to the academic teaching personnel employed in the selected higher education institutions in Cabanatuan City with at least one year of teaching experience, who served as the primary respondents evaluating digital competence, institutional challenges, and instructional performance.
- Cybersecurity Awareness. Measured by survey items evaluating faculty knowledge of best practices for protecting data and digital systems from threats.
- Digital Competence. Measured through a survey assessing faculty skills in using productivity tools, troubleshooting technical issues, and applying cybersecurity and data-handling practices on a Likert scale.
- Digital Literacy. Evaluated through faculty self-reported proficiency in basic computer operations, software use, and online communication skills necessary for teaching.
- ICT Infrastructure. Assessed by faculty responses regarding the availability and functionality of hardware, software, and network systems used in teaching and learning.
- Institutional Challenges. Assessed through faculty perceptions of barriers to integrating digital tools, including limitations in ICT resources, access to digital platforms, administrative support, and availability of professional development opportunities.
- Instructional Competence. Refers to the self-assessed pedagogical performance of Criminology faculty members in executing core teaching responsibilities.
- Readiness to Integrate Technology. Assessed by faculty self-rating on their willingness, confidence, and preparedness to adopt new digital tools and methods in teaching Criminology subjects.



II. Review of Related Literature and Studies

Introduction to the Review

This chapter presents a thematic review of related literature and studies concerning faculty digital competence and institutional challenges to criminology instructional competence. The review was organized thematically rather than according to the geographical origin or classification of the sources. This approach allows literature to be discussed according to the major concepts and variables directly related to the present study. This chapter provides the theoretical foundation for the study, explores empirical findings from previous research, and identifies gaps that justify the current investigation.

Digital Competence

Faculty digital competence has been widely recognized as essential for effective technology integration in higher education. It refers not only to the ability to operate computers and digital applications but also to the capacity to use digital technologies meaningfully, efficiently, and appropriately in solving technical problems, understanding ethical and cybersecurity concerns, teaching, assessment, research, and professional activities. Furthermore, digital competence was necessary for university teachers to effectively integrate information and communication technologies into pedagogical practice and that digital competence remains uneven across institutions and teaching contexts (Basilotta-Gómez et al., 2022).

Kakooei et al. (2024) further conceptualized faculty digital literacy into distinct functional areas: digital device usage competency (the ability to manipulate hardware and troubleshoot software), information management competency, and attitudinal competence. Their literature synthesis revealed that true digital competence goes beyond simple computer literacy; it requires an active mastery of specialized software and content management tools. The study concludes that universities must actively measure these specific indicators to prioritize budget allocations for targeted technical upskilling.

In addition, Nobis et al. (2026) explored the use of current digital technologies among higher education faculty in the Philippines and reported that faculty competence and motivation heavily influenced their implementation of digital tools, with learning management systems rated as highly important for basic teaching delivery.

Moreover, in the context of global digital transformation, Moreira-Choez et al. (2024) assessed the digital competencies of higher education faculty in Ecuador and highlighted that comprehensive evaluation frameworks must capture competency levels across multiple domains rather than relying on a teacher's general tech literacy. Their findings reinforce the multidimensional nature of faculty digital competence and support the assessment of specific skills relevant to instructional technology use.

The Technology Acceptance Model (TAM), provides another perspective on technology adoption. The model posits that an individual's intention to use new technology is determined by two primary factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In the context of higher education, if a faculty member believes that a digital tool will enhance their instructional delivery and is not overly complicated, they are more likely to adopt it (Schorr, 2023).

The Technological Pedagogical Content Knowledge (TPACK) framework further establishes that digital competence cannot be separated from pedagogical and content knowledge. According to Crompton and Burke (2023), modern educators must possess a synthesized understanding of how to ethically and effectively use digital tools



(Technological Knowledge) to teach complex, discipline-specific concepts (Content Knowledge) using appropriate teaching methods (Pedagogical Knowledge).

In highly specialized fields such as criminal justice and law enforcement education, digital competence takes on a more technical definition. Sinaga et al. (2021) conceptualize digital competence in this context as an organizational and educational capability necessary to process complex data into meaningful intelligence. Because modern crime heavily involves digital footprints and cyber-fraud, foreign literature emphasizes that modernizing the justice system begins at the academic level. Educators were expected to be theoretically grounded in the use of specialized tools such as Geographic Information Systems (GIS) for crime mapping, digital forensic environments, and secure case management databases.

Furthermore, recent foreign studies have begun focusing on specialized tech-driven academic fields. In an assessment of technological pedagogical content knowledge within criminal justice education, Johnson and Miller (2024) observed that instructors often struggle to transition from general productivity tools to specialized instructional technologies, such as geographic information systems (GIS) for crime mapping and digital forensics software.

Similarly, a study by Zakharevych and Hryhorenko (2024) found that teaching modern police intelligence requires the integration of artificial intelligence (AI), machine learning databases, cloud computing, and mobile forensics into the curriculum. However, empirical studies consistently identify that faculty frequently struggle with insufficient digital literacy when handling this advanced simulation software.

In an international study on the data handling practices of educators, Leung et al. (2026) emphasized that cyberattacks on educational institutions present a growing threat, making cybersecurity awareness an essential pillar of an educator's digital profile. Their research revealed critical gaps in teachers' understanding of media literacy, data protection, and security protocols across social media and cloud storage. The authors concluded that protecting sensitive academic and student data requires targeted institutional investments in mandatory, continuous professional development and cybersecurity literacy training.

This multidimensional need is particularly critical regarding data security; a study by Smith and Al-Majali (2024) investigating university educators' operational practices revealed that while faculty frequently utilize online tools, a significant majority lack formal training in data handling and cybersecurity protocols, leaving institutional networks vulnerable.

Reza et al. (2022) highlighted that faculty must rigorously teach ethical and legal awareness regarding digital data sharing to ensure students understand the integrity of digital evidence. Consequently, studies show that if Criminology faculty lack these advanced digital competencies, the development of students' practical skills is significantly hindered. The EDUCAUSE (2023) revealed that while 94% of higher education institutions mandate some form of security awareness training, faculty frequently lack the practical skills to mitigate human-centric cyber risks. The study noted that university faculty were primary targets for phishing attacks because they handle vast amounts of Personally Identifiable Information (PII) and student data. The EDUCAUSE (2023) findings strongly suggest that inadequate cybersecurity education directly results in faculty being unable to identify potential security breaches within their virtual learning environments.

To address the growing demands of modern academic environments, an empirical assessment of tertiary faculty members by Patalinghug (2024) examined digital citizenship behaviors, specifically focusing on digital security, etiquette, and rights. The study revealed that while faculty scored exceptionally high in basic digital etiquette, their practical



awareness of digital security and secure data handling protocols was significantly lower, leaving a critical gap in institutional safety that necessitates targeted administrative intervention and training.

Karimi and Khawaja (2025) likewise examined university teachers' digital competencies and identified a recurring trend where faculty members heavily rely on basic digital tools due to institutional constraints. Their findings underscore that barriers such as insufficient training, lack of preparation time, and inadequate digital resources prevent educators from unlocking advanced technological innovations. They emphasized that higher education institutions must design long-term strategies and structured training programs that seamlessly blend pedagogy with technology to successfully navigate digital transformations.

Furthermore, digital competence extends beyond basic ICT skills; it requires ongoing professional development and structured learning opportunities to build confidence and willingness to innovate. As a crucial factor impacting digital competence, continuous professional development enhances educators' digital knowledge and builds confidence in using advanced tools for instruction. The local literature highlights that professional growth initiatives, including workshops and structured training, were directly linked to improvements in digital skills. Without targeted and sustained development programs, faculty may remain dependent on basic skills and less prepared to adopt emerging technologies (Manlquez, 2025).

Likewise, Gayeta (2025) investigated faculty attitudes, computer skills, and the usage of educational technology among higher education instructors in Manila, Philippines. The findings indicated that although faculty generally held positive attitudes toward ICT integration and possessed competent basic computer skills, significant anxieties and operational gaps remained, prompting a strong recommendation for targeted training programs that cater to specific academic disciplines.

In addition, Abella and Rosa (2023) reported that Filipino teachers' digital literacy and competence were foundational for post-pandemic pedagogy, highlighting the need for improved digital skills to support online teaching and learning. Their findings illustrate that while many educators have foundational digital skills, gaps remain in areas such as data protection, ethical use of technology, and advanced tool utilization.

Local research also indicates that physical access to ICT and individual digital literacy significantly impact everyday classroom teaching practices. A regional study conducted in Central Visayas by Sumalinog (2022) revealed that while college faculty members had physical access to ICT infrastructure and displayed high motivation to integrate it, actual implementation success was deeply tied to the intersection of personal operational skills and resource functionality. Significant associations were found between faculty motivation, technical skill levels, and actual usage frequency, proving that mere physical access is insufficient without corresponding skills development.

Institutional Challenges

In the Philippine educational landscape, cybersecurity awareness and digital literacy were integral to digital competence, especially in contexts where educators handle sensitive data or facilitate online learning spaces. The concept of the "Digital Divide" is frequently cited in local literature to explain the disparity in technological access between highly urbanized universities in Metro Manila and provincial Higher Education Institutions (HEIs) in areas like Nueva Ecija. Local educational frameworks argue that systemic challenges—such as chronic infrastructural deficits, intermittent internet connectivity, and frequent power interruptions—fundamentally alter how digital competence is developed. Provincial



educators were often forced to prioritize "technological resilience" and offline-capable digital strategies over advanced, bandwidth-heavy instruction.

Following the disruptions of the COVID-19 pandemic, the Commission on Higher Education (CHED) institutionalized flexible learning modalities across professional programs through various memorandums. Local literature outlines that for practical and skill-intensive programs like Criminology, flexible learning must be a deliberate mix of online, blended, and limited face-to-face activities. Theoretical models of blended learning in the Philippines stress that successful implementation requires the intentional alignment of pedagogy and technology. However, local literature warns that shifting practical, laboratory-heavy criminal justice curricula to digital formats requires substantial institutional policy adjustments and massive technical investments that many provincial institutions still struggle to provide. In similar local studies, Sumile and Lozano (2025) found that the availability and functionality of ICT tools were significantly related to teachers' digital literacy skills, suggesting that infrastructure and access shape educators' ability to integrate technology effectively.

A study by Damayon (2022), assessing Criminology programs, found that while both students and faculty recognized the value of blended modalities, they experienced moderate to severe difficulties related to inadequate gadgets, poor signal strength, and a lack of premium digital academic resources. Furthermore, local researchers have identified that the digital skills gap among educators is a significant barrier; many faculty members report feeling unprepared to integrate ICT into their teaching practices due to insufficient institutional training.

Additionally, a study by Dizon (2026) explored the lived experiences of individuals navigating the digital divide in the rural and provincial Philippines. Dizon highlighted that despite national policies pushing for digital integration, individuals outside major metropolitan areas face chronic infrastructural deficits. Related studies investigating barriers to ICT integration in Philippine higher education frequently cite "technostress"—the burnout experienced by educators when forced to adopt new technologies without adequate pedagogical and technical support. These local findings validate the premise that without robust institutional infrastructure, dedicated computer maintenance facilities, and continuous professional development, faculty digital competence remains stagnant.

In addition to individual skills, institutional challenges such as limited ICT infrastructure, inconsistent policy implementation, and a lack of sustained training have also been documented as barriers to technology adoption in the country. Orbigoso and Pontillas (2025) reported that teachers generally possess competence in technology use but still face notable challenges in sustained technology integration due to infrastructure gaps and limited professional development. These barriers hinder the consistent use of digital tools and reduce faculty motivation to leverage technology fully in instruction. Ultimately, the role of institutional support, policy alignment, and resource availability were heavily emphasized as determinants of successful ICT integration in local education (Blando, 2025).

This is closely mirrored by data from Al-Qahtani (2025), which examined the institutional challenges of adopting virtual crime scene simulations in higher education. The study concluded that even when faculty were highly motivated, a lack of technical troubleshooting skills and inadequate IT support infrastructure act as severe institutional deterrents to sustained technology adoption.

Meanwhile, a regression analysis of factors affecting technology use among higher education teachers in the Visayas region conducted by Mananay et al. (2024) identified both



enabling and deterring factors that influence technology adoption in teaching functions. Their findings revealed that while faculty exhibit high extents of enabling factors, specifically in resource use and instructional design, critical deterring factors, such as the extensive time required to design multimedia and digital resources, significantly consume preparation time and act as operational barriers, heavily underscoring the critical role of the institutional context in digital integration.

Furthermore, Honicke et al. (2023) identified that an educator's "academic self-efficacy"—their inherent belief in their ability to navigate these digital platforms securely—is the central predictor of actual digital skill development.

Instructional Competence

Instructional competence refers to the knowledge, skills, capabilities that enable teachers to effectively plan, deliver, manage, and evaluate instruction. König et al. (2021), examined the relationship between teachers' pedagogical competence and instructional quality and demonstrated the importance of teachers' competencies in explaining differences in instructional quality. Their findings provide support for considering instructional competence as an important component of effective teaching rather than merely a measure of teachers' knowledge. In digitally enhanced environments, instructional competence becomes increasingly important because teachers were required to combine pedagogical strategies with appropriate technological sources.

Additionally, Runge et al. (2023) examined teacher-reported instructional quality in the context of digitally enhanced teaching, highlighting the importance of considering instructional quality when technology becomes part of classroom practice.

In the Philippine higher education context, Besa and Limpot (2023) investigated the relationship among TPACK, instructional competence, teachers' attitudes toward internet use, and readiness to teach online among 674 college teachers in Region XII. The researchers found that teachers demonstrated a very high level of instructional competence and that instructional competence and attitudes toward internet use significantly influenced readiness to teach online. Their findings suggest that instructional competence remains important when faculty members transition toward technology-supported and online teaching. The authors further emphasized the importance of integrating TPACK into professional development programs to strengthen teachers' readiness for technology-based instruction.

Moreover, the connection between technology and teaching competence is also demonstrated by Resol (2022), who examined the impact of cloud computing on the teaching competence of Information Technology faculty at the Iloilo State College of Fisheries. The study found that cloud computing had a high impact on the teaching competence of the participating faculty members and recommended training in cloud computing for both IT and non-IT faculty. This suggests that technological tools can influence how faculty members perform their teaching responsibilities and that professional development is necessary to maximize the instructional value of emerging technologies.

Similarly, Licayan and Arroyo (2025) found that Technology and Livelihood Education teachers in Valencia City, Bukidnon demonstrated a high level of instructional competencies and were identified as particularly strong. Their findings also emphasized continuing professional development to maintain instructional quality.

Likewise, Aying (2026) examined instructional and digital competence simultaneously among Technology and Livelihood Education teachers in Lapu-Lapu City. The study found



very high levels of both instructional and digital competence and recommended a professional development plan to further strengthen these areas.

Synthesis of the Review of Related Literature and Studies

The reviewed literature and studies establish that digital competence, institutional challenges, and instructional competence were interconnected. In this study, faculty digital competence encompasses the faculty members' ability to efficiently identify, locate, critically evaluate, organize, and analyze digital information and data relevant to Criminology instruction and research. Also, the instructors' adherence to digital safety, copyright laws, intellectual property rights, cybersecurity, and ethical standards when utilizing online tools, managing student records, and delivering instruction.

Meanwhile, instructional competence concerns the faculty member's ability to effectively plan, deliver, manage, and evaluate instruction. Studies by Besa and Limpot (2023), Konig et al. (2021), Runge et al. (2023), and Aying (2026) demonstrate the importance of instructional competence and instructional quality in technology-supported teaching, while Resol (2022) and other related studies show how technological resources can influence teaching competence. At the same time, the literature identifies institutional challenges such as inadequate ICT infrastructure, unstable connectivity, limited digital resources, insufficient technical support, and inadequate professional development as factors that may constrain faculty members' ability to apply their digital and instructional competencies effectively.

Despite the growing literature on digital competence, institutional challenges, and instructional competence, there remains limited research specifically examining Criminology faculty in provincial higher education institutions, particularly in Cabanatuan City, Nueva Ecija. Existing studies have generally focused on teachers or faculty members from other disciplines and educational contexts, with comparatively limited attention to the combined digital, instructional, and institutional dimensions of Criminology instruction. This study addresses this gap by examining the digital competence of Criminology faculty, the institutional challenges they face, to the instructional competence. The findings aim to provide a context-specific understanding that can guide policies, targeted training, and resource allocation to enhance digitalization in Criminology education.

III. Research Methodology

This chapter details the systematic procedures and methodologies employed to conduct the study. It provides a comprehensive overview of how the research was executed to achieve the study's objectives regarding faculty digital competence and institutional challenges to Criminology instructional competence. Specifically, this chapter discusses the research design used to frame the investigation, the research locale where the study was conducted, and the population and sampling techniques utilized to select the respondents. Furthermore, it describes the research instrument and data gathering procedure employed to collect information, the data processing and statistical treatment applied to analyze the gathered data, and the ethical considerations strictly observed throughout the research process.

Research Design

This study was anchored on the positivist research paradigm, which asserts that reality can be observed, measured, and quantified objectively. Under this philosophical umbrella, the study utilizes a Quantitative Multi-Method Research Design to examine Faculty Digital Competence and Institutional Challenges to Criminology Instructional Competence across campuses in Cabanatuan City, Nueva Ecija. The design combines three complementary quantitative methods: Methodological Questionnaire Development, Survey Correlation and Regression Analysis, and Enhancement Framework Development. These methods were



conducted sequentially to develop an appropriate research instrument, collect and statistically analyze quantitative data, and use the findings as a basis for developing an enhancement framework for Criminology instruction.

- Method 1: Methodological Questionnaire Development. This method involved the development and validation of a structured questionnaire measuring the respondents' digital competence, institutional challenges, and Criminology instructional competence. The instrument underwent appropriate validation and reliability testing before its administration.
- Method 2: Survey Correlation and Regression Analysis. A quantitative survey was conducted among Criminology faculty to determine the levels of digital competence, institutional challenges, and Criminology instructional competence. Descriptive statistics were used to summarize the data, while correlation analysis examined the associations among variables. Multiple regression analysis was used as the primary inferential analysis to determine whether digital competence and institutional challenges significantly predict Criminology instructional competence.
- Method 3: Enhancement Framework Development. An enhancement framework was developed based on the results of the quantitative analysis. The framework identified appropriate strategies for strengthening faculty digital competence, addressing institutional challenges, and improving Criminology instructional competence.

This design enabled the study to measure the three major variables, determine the predictive effect of digital competence and institutional challenges on Criminology instructional competence, and develop an evidence-based enhancement framework based on the findings.

Research Locale

The study was conducted in Cabanatuan City, a first-class component city in Nueva Ecija recognized as the primary center for education, commerce, and economic activity in Central Luzon. Hosting several Higher Education Institutions (HEIs) offering Commission on Higher Education (CHED) recognized Criminology programs, Cabanatuan City serves as an ideal setting for examining Criminology faculty digital competence and instructional performance across diverse organizational contexts. To obtain a representative cross-section of Criminology education in the region, the research focused on five higher education institutions. In compliance with ethical research standards and to maintain institutional confidentiality, these institutions were designated as University A, University B, University C, University D, and University E.

University A represents a private, non-sectarian university affiliated with a major educational network, characterized by high student enrollment in Criminology and a structured digital learning system. University B represents a private foundation college operating within a localized community framework, offering a specialized academic environment with a dedicated focus on Criminology education. University C represents a private, non-sectarian higher education institution situated in an urban setting, featuring a compact campus layout and a localized administrative infrastructure.

University D represents an established private, sectarian university operating under a faith-based administrative framework, boasting extensive academic facilities and long-standing institutional protocols. Meanwhile, University E represents a major public state university with multiple campuses across the province, serving a large state-funded student population under public higher education governance and state-allocated technology frameworks.

These five distinct institutional contexts provide a rich and comprehensive setting for evaluating Criminology educators. By encompassing state-funded, private non-sectarian, private sectarian, and foundation-based institutions, the locale allows the study to



effectively examine Criminology faculty digital competence while capturing how varying institutional challenges directly shape instructional competence.

Population and Sampling Scheme

The target population of this study comprises Criminology faculty members currently teaching in the five selected higher education institutions in Cabanatuan City. To ensure that participants possess sufficient background and pedagogical exposure to evaluate instructional competence and institutional challenges, the respondents are strictly limited to Criminology instructors with at least one (1) year of teaching experience. The study excludes students, non-criminology faculty, and administrative personnel, as the scope was limited to the self-reported digital competencies and institutional challenges experienced directly by Criminology educators. To select the respondents, this study employs non-probability sampling, specifically purposive sampling, supplemented by snowball sampling. Purposive sampling was utilized as the primary technique to intentionally select respondents who meet the specified inclusion criteria. According to Wilkins (2024), purposive sampling allows researchers to deliberately choose participants who possess specific knowledge, professional experience, and characteristics relevant to the phenomenon under investigation. Through this technique, Criminology educators with eligible teaching tenure were targeted to ensure that gathered data accurately reflect actual workplace experiences and instructional practices. To address the practical constraint of not having access to a centralized, complete master list of Criminology faculty across all five participating campuses, snowball sampling was applied as a supplementary technique. Snowball sampling involves identifying initial key informants within each institution who meet the inclusion criteria and requesting them to refer or connect the researcher with other eligible Criminology colleagues (Ting et al., 2025). This dual-sampling approach ensures maximum participation and representative coverage across state-funded, private non-sectarian, private sectarian, and foundation-based Criminology departments in the locale.

Description of the Respondents

A critical parameter in establishing the contextual validity of this descriptive study was the nuanced composition of the target respondents. The eighty (80) faculty members who comprise the research sample represent a highly specialized cohort of educators within the field of criminal justice education in Cabanatuan City. Unlike traditional academic disciplines, where faculty tracks were strictly linear and purely academic, Criminology faculty in provincial Higher Education Institutions (HEIs) present a unique blend of diverse professional profiles, educational attainments, and instructional exposures. Understanding these characteristics provides a necessary foundation for interpreting their self-reported digital competencies and assessments of institutional challenges.

The distribution of respondents according to university was presented in below:

Table 1. Distribution of Respondents

University	Faculty Members
University A	40
University B	15
University C	10
University D	2
University E	13
Total	80



1. Professional Background

The respondents were full-time and part-time academic instructors, which consists of regular, full-time faculty members whose primary career was higher education. They were typically deeply immersed in the day-to-day use of the university's Learning Management Systems (LMS), digital grading portals, and basic productivity software. Their digital competence was often shaped by continuous, institutional exposure to educational technologies.

2. Subject Specialization

The respondents were further categorized by their instructional assignments across the six (6) core areas of the standardized Bachelor of Science in Criminology curriculum as mandated by the Commission on Higher Education (CHED). These areas include:

- Criminal Law and Jurisprudence
- Law Enforcement Administration
- Crime Detection and Investigation
- Forensics/Criminalistics
- Correctional Administration
- Criminology

The respondents handling highly technical laboratory units, such as Forensics and Criminalistics, represent a distinct segment of the sample. These specific educators require not only basic productivity competence (such as word processing for syllabi creation) but also highly specialized technological literacy to operate or simulate digital forensic setups, automated fingerprint analysis systems, and crime-scene mapping software. Conversely, instructors assigned to lecture-heavy units, such as Criminal Law, interact primarily with text-based tools and presentation software.

3. Institutional Distribution across Public and Private Sectors

The final descriptive layer of the respondents was their institutional distribution across the five selected campuses. The sample was purposefully drawn to reflect a balanced representation between the public and private educational sectors in Cabanatuan City.

Respondents from the University A represent educators working within a large-scale, where faculty members typically manage massive student populations per class section, magnifying the need for efficient digital management tools.

Respondents from private institutions, University B, University C, University D, represent educators navigating corporate university structures or localized private setups, where the availability of proprietary software licenses, commercial internet bandwidth, and institutional technical support varies heavily. While University E, as a state-funded public university, represents educators operating within government-allocated budget cycles, centralized IT procurement frameworks, and high student-to-faculty ratios, where technological resources and digital infrastructure depend directly on public sector appropriations and state higher education policies.

This multi-institutional distribution ensures that the descriptive data gathered does not merely reflect the isolated environment of a single campus, but instead provides a holistic description of the diverse Criminology teaching force operating within a first-class provincial city.

Research Instrument

The primary research instrument utilized to gather data for this descriptive study was a structured, researcher-formulated survey questionnaire checklist to measure faculty digital



competence, institutional challenges, and Criminology instructional competence across campuses in Cabanatuan City. The questionnaire underwent expert validation to assess the clarity, relevance, and adequacy of its items. The comments and recommendations of the validators were considered, and necessary revisions were made to improve the questionnaire.

After the revisions, the instrument underwent pilot and final testing to establish its reliability and identify items requiring further revision. Once finalized, the questionnaire was administered to the identified Criminology faculty across the selected campuses in Cabanatuan City, Nueva Ecija.

To ensure the logical flow and clarity of data collection, the survey questionnaire was structurally divided into three distinct parts, each mapping out a specific core variable of the study:

Part I: Faculty Digital Competence

This section assesses the respondents' self-reported capability across fundamental digital operations, such as creating instructional materials using word processing applications, tracking student records via spreadsheets, utilizing presentation software, and basic hardware or software troubleshooting. The structural formulation of these items was heavily anchored on the digital literacy frameworks synthesized in Chapter 2, specifically the functional literacy components highlighted by Kakooei et al. (2024), which emphasize that basic hardware manipulation and resource management form the foundation of an educator's digital profile.

Part II: Institutional Challenges

This section measures the institutional challenges encountered by Criminology faculty, including the availability and reliability of technological infrastructure, stability of campus internet bandwidth, access to specialized hardware and software, availability of technical support services, and administrative policy backing. These survey items were directly operationalized from the foundational literature of Leung et al. (2026), who posited that organizational infrastructure, resource allocation, and systemic institutional support serve as critical environmental determinants of effective instructional delivery and technology integration.

Part III: Instructional Competence

This final section measures the instructional competence of Criminology faculty, evaluating their overall teaching performance across pedagogical delivery, classroom management, curriculum implementation, and student assessment strategies. It gathers data on the instructors' ability to design effective lesson plans, utilize interactive teaching methodologies, evaluate learning outcomes objectively, and integrate domain-specific Criminology concepts into classroom instruction. The formulation of these items was backed by the empirical findings of Johnson and Miller (2024) and Orbigoso and Pontillas (2025), who highlighted that pedagogical adaptability, structured learning assessments, and mastery of instructional delivery serve as essential indicators of overall teaching excellence in higher education.

All survey items employed a four-point Likert scale with specific verbal descriptors for each section to guide the respondents' answers. The four-point configuration was deliberately selected to eliminate a neutral or ambivalent midpoint response (such as "Undecided" or "Neutral"), thereby forcing the respondents to make an active, definitive self-assessment based on their actual teaching experiences.



Validity and Reliability

To ensure the academic integrity and technical accuracy of the research findings, the self-constructed survey questionnaire underwent a two-stage validation and reliability testing process.

First, content validation was conducted to determine the relevance, clarity, and appropriateness of the items included in the instrument. The questionnaire was evaluated by a panel of experts composed of professionals in the fields of Criminology education, Educational Technology, and Research Methodology. These validators carefully reviewed the assessment items distributed across the main operational domains of the study: Digital Competence, Institutional Challenges, and Instructional Competence. Their evaluation focused on the alignment of the questionnaire items with the research objectives, ensuring theoretical consistency, clarity, and adherence to operational standards for digital literacy and pedagogical performance in higher education.

The experts also examined the wording, structure, and clarity of each survey item to ensure that the statements were unambiguous and easily understood by the target respondents. All comments, constructive suggestions, and technical refinements provided by the validators were carefully incorporated into the final version of the instrument. This process enhanced the instrument's conceptual accuracy, face validity, and overall suitability for evaluating Criminology faculty members across the five selected higher education institutions in Cabanatuan City.

Second, the reliability of the instrument was determined through a preliminary pilot test using Cronbach's Alpha to measure internal consistency prior to actual data collection. The pilot test was administered to 15 Criminology faculty members at a university located outside Cabanatuan City. Aligning with the general methodological rule of thumb in educational research, which establishes that a sample size of 10 to 30 respondents (or approximately 10% of the sample) was optimal for evaluating instrument clarity and internal consistency during pre-testing (Connelly, 2008; Julious, 2005), this group shared identical academic criteria without contaminating or overlapping with the main study sample in Cabanatuan City.

The pilot test data were analyzed to evaluate whether the items across each operational variable, Digital Competence, Institutional Challenges, and Instructional Competence, consistently measured their intended constructs. The reliability analysis yielded an overall Cronbach's Alpha coefficient of 0.82, indicating a high level of internal consistency according to standard statistical benchmarks in social research. This confirmed that the questionnaire items were unambiguous, consistently interpreted, and capable of generating dependable data.

Therefore, the combined results of expert content validation and the preliminary pilot test verified that the self-constructed survey questionnaire was both valid and reliable, confirming its suitability for deployment across the five participating higher education institutions in Cabanatuan City.

Data Gathering Procedures

To ensure a systematic, ethical, and highly organized collection of data, the researcher executed the data gathering process in three distinct, chronological phases: the pre-data gathering phase, the actual data administration phase, and the post-data gathering phase. Before any contact with potential respondents, the researcher first secured full ethical clearance. Upon approval, the researcher drafted formal letters of request to conduct the study. These letters were addressed to the University Presidents, Campus Directors, and the respective Deans of the College of Criminal Justice Education (or equivalent Criminology



departments) of the five selected institutions. After approval, the researcher coordinated with the respective campus administrators and/or Criminology faculty who served as respondents. The purpose of the study, the data collection procedure, and the rights of the respondents were explained to them, and informed consent was secured prior to participation.

Following the approval and identification of respondents, the validated and reliability-tested questionnaire was administered to the qualified Criminology faculty. Recognizing the demanding schedules and diverse teaching modalities of Criminology faculty members, the researcher employed a dual-modality approach for data collection: in-person administration and online surveying.

For in person administration, the researcher personally distributed the questionnaire or provided the approved survey format to the respondents, depending on the arrangement with each campus. Respondents were given sufficient time to complete the instrument, and the researcher was available to clarify questions concerning the instructions without influencing their responses.

For the online survey administration, a digitized version of the questionnaire was created using secure platforms such as Google Forms. This modality caters to faculty members who are teaching purely online classes, those working off-campus, or those who prefer to answer the survey at their own convenience. The link to the survey was distributed via official university email addresses or professional faculty group chats, subject to the Dean's approval. The online form was programmed to make all Likert-scale items "required" to prevent the submission of incomplete data. To facilitate the snowball sampling method, a section at the end of both the physical and digital surveys politely ask respondents if they can refer or forward the survey link to other eligible Criminology colleagues within their institution. A polite follow-up reminder was sent to online participants after three to five days to encourage completion.

After the respondents completed the questionnaire, the researcher retrieved and checked each accomplished instrument for completeness. Incomplete questionnaire was identified and handled accordingly. The completed responses then were coded, tabulated, and organized for statistical analysis.

The gathered data were analyzed according to the research questions. Descriptive statistical measures were used to determine the levels of digital competence, institutional challenges, and Criminology instructional competence, while correlation analysis was used to examine the associations among the variables. Multiple regression analysis was then conducted to determine whether digital competence and institutional challenges significantly predict Criminology instructional competence. The result served as the basis for developing the proposed enhancement program framework supporting digital competence and mitigating institutional challenges. All gathered information was treated confidentially and used solely for the purpose of the study.

Data Processing and Statistical Treatment of Data

Before the application of statistical computations, the raw data gathered from the survey questionnaires underwent a rigorous process of data preparation, which includes coding, cleaning, and tabulation. Data from printed questionnaires was manually transcribed into a master spreadsheet, while digital responses from online forms were directly exported to eliminate encoding errors. The data was coded, assigning numerical values to categorical responses, and imported into a statistical software package, such as the Statistical Package for the Social Sciences (SPSS), for precise computational analysis.



Because the study's research design focuses solely on assessing and describing existing conditions without predicting outcomes or testing variable manipulations, strictly descriptive statistics was employed. Specifically, the following statistical tools were utilized to answer the variables outlined in the Statement of the Problem:

Weighted Mean and Standard Deviation

The level of faculty digital competence, the extent of institutional challenges encountered, and the level of Criminology instructional competence were determined using the weighted mean. This statistical measure was used to compute the average rating of the respondents for each indicator included in the questionnaire.

In addition, standard deviation was used to determine the degree of variability or dispersion of the responses. This measure helped identify the level of agreement or consistency among the respondents' assessments across all operational variables. The results were interpreted using the following Likert Scale:

Table 2. Scoring and Data Interpretation Guide

Mean Range	Interpretation for Competence Variables	Interpretation for Institutional Challenges
3.25-4.00	Highly Competent	Very Serious Challenge
2.50-3.24	Competent	Serious Challenge
1.75-2.49	Slightly Competent	Slight Challenge
1.00-1.74	Not Competent	Not a Challenge

The formula used for computing the weighted mean was presented below:

$$WM = \frac{\sum fx}{N}$$

Where:

- WM = Weighted Mean
- Σ = Summation of the values following it
- f = Frequency of response
- x = Weight assigned to response (1 to 4)
- N = Total number of respondents

The formula used for computing the standard deviation was presented below:

$$SD = \sqrt{\frac{\sum (x_i - \bar{x})^2}{N - 1}}$$

Where:

- SD = Standard Deviation
- x_i = Individual score for each item
- $\bar{x}$ = Computed sample mean
- N = Total number of respondents

Pearson Product-Moment Correlation Coefficient (r)



To determine whether there was a significant relationship between faculty digital competence and Criminology instructional competence, the Pearson r correlation was used. This statistical test was appropriate when measuring the strength and direction of a linear association between two continuous variables. The hypothesis was tested at a 0.05 level of significance. If the computed p-value was less than 0.05, the null hypothesis ($H_{(o1)}$) was rejected, indicating that a statistically significant relationship existed between the two variables.

The formula used for computing Pearson's r was presented below:

$$r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}}$$

Where:

- r = Pearson correlation coefficient
- X = Faculty Digital Competence score
- Y = Criminology Instructional Competence score
- N = Total number of respondents

Multiple Linear Regression Analysis

To determine whether faculty digital competence and institutional challenges significantly predicted Criminology instructional competence both individually and jointly, Multiple Linear Regression Analysis was used. This statistical technique was appropriate when evaluating the predictive effect of two or more independent variables on a single continuous dependent variable. The hypothesis was tested at a 0.05 level of significance. If the computed p-value for a predictor was less than 0.05, the null hypothesis ($H_{(o2)}$) was rejected, confirming that the independent variable significantly predicted instructional competence.

The model equation used for multiple linear regression was presented below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

Where:

- Y = Predicted Criminology Instructional Competence score
- β_0 = Constant term (Y -intercept)
- β_1 = Unstandardized regression coefficient for Faculty Digital Competence
- β_2 = Unstandardized regression coefficient for Institutional Challenges
- X_1 = Predictor variable score for Faculty Digital Competence
- X_2 = Predictor variable score for Institutional Challenges
- ϵ = Random error term

All statistical computations were performed using appropriate statistical software under the supervision of a professional statistician to ensure the technical accuracy and reliability of the analysis.

Ethical Considerations

The conduct of this study strictly adhered to the highest ethical standards and guidelines established for human-subject research. Because this study involves the collection of self-reported data from faculty members regarding their professional competencies and institutional environments, safeguarding their rights, welfare, and professional dignity was of paramount importance. The research protocol was anchored on the core ethical principles of respect for persons, beneficence, and justice, ensuring that the research process does not inflict any psychological, professional, or social harm upon the respondents.



Before the administration of any survey instrument, explicit informed consent was secured from all participants. An Informed Consent Form (ICF) was attached to the front page of both the printed questionnaires and the digital Google Forms. This form comprehensively details the purpose of the study, the nature of their involvement, the estimated time required to complete the survey, and the potential impact of the research. Furthermore, the principle of voluntary participation was strictly observed. Respondents were explicitly informed that their participation was entirely voluntary and that they reserve the absolute right to decline participation, leave questions unanswered, or withdraw from the study at any point without facing any professional penalties, administrative reprimands, or loss of benefits from their respective institutions.

To protect the professional reputation of the faculty members, particularly those who may report low digital competence or highlight severe institutional deficiencies, strict anonymity and confidentiality protocols were enforced. While "anonymity" means the researcher does not know the identity of the respondent, "confidentiality" means the researcher may know the identity but legally promises not to disclose it. In this study, demographic identifiers that could be used to trace specific answers back to individual teachers (such as exact age, specific employment ID, or specific department sub-roles) was minimized or omitted. Data was aggregated during the analysis phase so that individual responses were generalized. No individual faculty member was named in the final manuscript, and any references to specific institutional challenges were discussed collectively rather than being attributed to a specific person.

The researcher explicitly commits to full compliance with Republic Act No. 10173, otherwise known as the Philippine Data Privacy Act of 2012. All data gathered was treated with the utmost confidentiality and was used exclusively for academic and research purposes. Digital data derived from online surveys was encrypted and stored in a password-protected physical hard drive and a secure cloud storage account accessible only to the primary researcher and the research adviser. Any physical copies of the answered questionnaires were locked in a secure filing cabinet.

A strict data retention and disposal policy was implemented to prevent unauthorized access to the data post-research. The gathered data was retained only for a period of six (6) months to one (1) year following the successful final defense and publication of the manuscript. Upon the expiration of this retention period, all digital files, including raw spreadsheet data and SPSS outputs, were permanently wiped from all storage devices. Physical documents, including printed surveys and signed consent forms, were thoroughly destroyed using a cross-cut paper shredder.

The study was classified as having minimal risk. The primary foreseeable risk involves potential psychological discomfort or professional apprehension if respondents feel their lack of digital skills or their critique of their institution's ICT infrastructure might be exposed to their Deans or school administrators. This risk was heavily mitigated by the strict confidentiality measures outlined above. While there was no direct financial compensation for participating in this study, the respondents benefit indirectly; their honest feedback serves as the empirical foundation for proposing targeted, data-driven faculty development programs and institutional ICT upgrades.

Before any data gathering commences, the researcher secures the necessary endorsements and approvals from the institution's designated Ethics Review Board or Committee. The full research proposal, along with the survey instruments and informed consent forms, were submitted for ethical clearance to ensure that all methodologies align with the university's ethical research standards. Furthermore, formal letters of request to conduct the study were



submitted to the Deans or Campus Directors of the selected participating institutions out of respect for institutional protocols.

IV. Presentation, Analysis, and Interpretation of Data

This chapter presents the analysis, interpretation, and discussion of the data gathered from the respondents of the study. The results were organized according to the sequence of the research questions stated in the Statement of the Problem. The data collected through the survey questionnaire were carefully analyzed using appropriate statistical tools to determine the level of faculty digital competence, institutional challenges, and criminology instructional competence across campuses in Cabanatuan City. The findings of the study were presented in tables and were followed by corresponding interpretations and discussions to provide a clearer understanding of the results.

1. Level of Digital Competence of the Criminology Faculty

The table 3 presented the weighted mean, verbal interpretation, and standard deviation of the respondents in terms of the level of digital competence of the criminology faculty.

Legend: 3.25-4.00 Highly Competent (H.C); 2.50-3.24 Competent (C); 1.75-2.49 Slightly Competent (S.C); 1.00-1.74 Not Competent (N.C); Weighted Mean (W.M.); Standard Deviation (S.D.); Verbal Interpretation (V.I.)

As indicated in Table 3, the average weighted mean of the level of digital competence of criminology faculty in the campuses of Cabanatuan City, Nueva Ecija was 3.45 (SD = 0.43) with a verbal interpretation of Highly Competent. This indicates the respondents generally rated their digital competence positively. This finding was consistent with the conception that digital competence of faculty members involves a set of skills that were operationalized in teaching, communication and responsible management of digital information (Basilotta-Gómez-Pablos et al., 2022).

The highest weighted mean (WM = 3.54, SD = 0.57) was obtained for compliance with statutory data privacy requirements in the storage or publication of students' academic work. The interpretation was highly competent. The faculty thus viewed protecting student information as one of their better digital practices. The responsible and safe use of digital information was also considered part of educators' digital competence Reza et al. (2022).

In contrast, the lowest weighted mean (WM = 3.05, SD = 0.76) was achieved for the use of open-source intelligence (OSINT) techniques and online public records to create practical investigative examples, which was classified as Competent. This was still considered good by the faculty but it could be an area for further training. Open-source information can underpin practical learning activities of forensic intelligence (Morelato et al., 2023). To summarize, results show positive self reported digital competence with potential to increase the use of OSINT in criminology education.



Table 3. Faculty Digital Competence

Statement	W.M.	S.D.	V.I.
1.1 Searching official online legal and criminological databases (e.g. government portals) to update course syllabi and lecture content.	3.49	0.59	H.C.
1.2 Evaluating the credibility, accuracy, and academic rigor of online sources before integrating them into classroom presentations.	3.53	0.55	H.C.
1.3 Organizing and structuring digital teaching files systematically across local drives and cloud storage (e.g., Google Drive, OneDrive) for rapid retrieval.	3.51	0.55	H.C.
1.4 Utilizing spreadsheet applications (e.g., Excel, Google Sheets) to aggregate, filter, and calculate student performance metrics.	3.41	0.67	H.C.
1.5 Utilizing open-source intelligence (OSINT) techniques and public records online to build practical investigative examples.	3.05	0.76	C.
1.6 Managing privacy settings and restriction controls on cloud-shared document folders to prevent unauthorized edit access.	3.51	0.59	H.C.
1.7 Applying proper citation, attribution, and intellectual property standards when using digital multimedia in teaching materials.	3.39	0.66	H.C.
1.8 Maintaining appropriate professional boundaries when communicating with students via private messaging or social media platforms.	3.50	0.69	H.C.
1.9 Adhering to statutory data privacy requirements (e.g., Data Privacy Act of 2012) when storing or publishing student academic work.	3.54	0.57	H.C.
1.10 Establishing clear ethical guidelines for student usage of Generative AI tools in criminological research and essay writing.	3.53	0.59	H.C.
A.W.M.	3.45	0.43	H.C.
Statement	W.M.	S.D.	V.I.
1.1 Searching official online legal and criminological databases (e.g. government portals) to update course syllabi and lecture content.	3.49	0.59	H.C.
1.2 Evaluating the credibility, accuracy, and academic rigor of online sources before integrating them into classroom presentations.	3.53	0.55	H.C.
1.3 Organizing and structuring digital teaching files systematically across local drives and cloud storage (e.g., Google Drive, OneDrive) for rapid retrieval.	3.51	0.55	H.C.
1.4 Utilizing spreadsheet applications (e.g., Excel, Google Sheets) to aggregate, filter, and calculate student performance metrics.	3.41	0.67	H.C.
1.5 Utilizing open-source intelligence (OSINT) techniques and public records online to build practical investigative examples.	3.05	0.76	C.



1.6 Managing privacy settings and restriction controls on cloud-shared document folders to prevent unauthorized edit access.	3.51	0.59	H.C.
1.7 Applying proper citation, attribution, and intellectual property standards when using digital multimedia in teaching materials.	3.39	0.66	H.C.
1.8 Maintaining appropriate professional boundaries when communicating with students via private messaging or social media platforms.	3.50	0.69	H.C.
1.9 Adhering to statutory data privacy requirements (e.g., Data Privacy Act of 2012) when storing or publishing student academic work.	3.54	0.57	H.C.
1.10 Establishing clear ethical guidelines for student usage of Generative AI tools in criminological research and essay writing.	3.53	0.59	H.C.
A.W.M.	3.45	0.43	H.C.

2. Level of Institutional Challenges

The table 4 presented the weighted mean, verbal interpretation, and standard deviation of the respondents in terms of the level of institutional challenges.

Table 4. Level of Institutional Challenges

Statement	W.M.	S.D.	V.I.
2.1 Inadequate access to ICT infrastructure and instructional equipment (e.g., computers, projectors, digital laboratory tools, and devices) for Criminology instruction.	2.39	0.94	Se.C.
2.2 Unstable campus internet connectivity and frequent power interruptions that disrupt instructional delivery and online academic activities.	2.70	0.91	Si.C.
2.3 Limited technical and IT support services to resolve hardware, software, and system glitches promptly.	2.50	0.87	Si.C.
2.4 Insufficient institutional training and professional development programs focused on digital teaching tools and educational technologies.	2.49	0.99	Se.C.
2.5 Limited institutional allocation of resources and preparation time for designing technology-integrated lessons.	2.45	0.91	Se.C.
2.6 Inconsistent institutional policies and guidelines regarding technology integration across departments or satellite campuses.	2.33	0.89	Se.C.
2.7 Inadequate institutional access to specialized digital applications and technical guidance required for Criminology instruction.	2.55	0.88	Si.C.
2.8 Limited collaboration among administrators, ICT personnel, and faculty in planning institutional technology initiatives.	2.36	0.84	Si.C.
2.9 Lack of regular institutional assessment of faculty ICT needs to inform training and resource allocation.	2.44	0.82	Si.C.
2.10 Limited institutional capacity to adapt infrastructure to emerging technological demands in Criminology education.	2.55	0.86	Se.C.
A.W.M.	2.48	0.74	Si.C.

Legend: 3.25-4.00 Very Serious Challenge (V.S.C); 2.50-3.24 Serious Challenge (Se.C); 1.75-2.49 Slight Challenge (Si.C); 1.00-1.74 Not a Challenge (N.C); Weighted Mean (W.M.); Standard Deviation (S.D.); Verbal Interpretation (V.I.)

As indicated in Table 4, the Level of Institutional Challenges Encountered by the Criminology Faculty in the Campuses of Cabanatuan City, Nueva Ecija has a mean weighted average of 2.48 (SD = 0.74), with a verbal interpretation of Slight Challenge. It implies that the respondents generally perceived that the listed institutional conditions were



a slight challenge. But it does not mean that all conditions were absent at all campuses. Research on university teaching also suggests that barriers to the use of technology might vary across institutions and instructional contexts (Orbigoso and Pontillas, 2025).

The highest rated statement was about the unstable internet connectivity in the campus and the frequent power interruptions that disrupted instruction and online academic activities (WM=2.70, SD=0.91) interpreted as Serious Challenge. This was the most strongly felt challenge of the listed conditions. This was consistent with the finding of Aljanazrah et al. (2022) who identified that unstable internet and electricity interruptions were challenges of digital teaching and learning. The result suggests that improving reliability of connection and planning for interruptions may be helpful in supporting instructional continuity across the campuses.

The lowest rated statement was inconsistent institutional policies and guidelines on technology integration across departments or satellite campuses (WM = 2.33, SD = 0.89) as Slight Challenge. Hence, respondents expressed the least agreement for policy inconsistency as a challenge. Aggregated, the ratings say more about connectivity and power interruptions than differences in institutional guidelines as a perceived concern. This interpretation was limited to the reported evaluations of the faculty and does not determine the state of the infrastructure or policies by direct inspection.

3. Level of Criminology Instructional Competence

The table 5 presented the weighted mean, verbal interpretation, and standard deviation of the respondents in terms of the level of criminology instructional competence.

Table 5. Level of Criminology Instructional Competence

Statement	W.M.	S.D.	V.I.
3.1 Planning Criminology instruction by aligning course learning outcomes, subject matter, learning activities, and assessment methods in lesson plans.	3.53	0.61	H.C.
3.2 Selecting appropriate teaching strategies (e.g., case studies, simulations, problem-based learning) tailored to specific Criminology topics and student needs.	3.53	0.57	H.C.
3.3 Delivering Criminology lectures clearly and accurately by bridging legal theories and criminological concepts with actual criminal justice practices.	3.53	0.55	H.C.
3.4 Facilitating practical and experiential learning activities (e.g., crime-scene processing scenarios, investigative exercises, forensic demonstrations).	3.38	0.51	H.C.
3.5 Synthesizing criminological content, pedagogical strategies, and digital tools (TPACK) to make complex legal and investigative concepts accessible.	3.25	0.62	H.C.
3.6 Integrating digital legal databases, open-source records, or cloud platforms into classroom demonstrations of modern criminal investigation procedures.	3.21	0.63	C.
3.7 Instilling proper digital ethics, legal protocols, and cybersecurity practices among students when handling case data and evidence in class.	3.29	0.69	H.C.
3.8 Evaluating student learning and instructional effectiveness using appropriate diagnostic, formative, and summative assessment tools.	3.43	0.67	H.C.
3.9 Providing timely, constructive feedback on student submissions through digital assessment platforms and learning management tools.	3.31	0.73	H.C.
3.10 Developing standardized rubrics and scoring criteria for evaluating student performance in practical laboratory exercises and digital simulations.	3.33	0.75	H.C.
A.W.M.	3.38	0.47	H.C.



Legend: 3.25-4.00 Highly Competent (H.C); 2.50-3.24 Competent (C); 1.75-2.49 Slightly Competent (S.C); 1.00-1.74 Not Competent (N.C); Weighted Mean (W.M.); Standard Deviation (S.D.); Verbal Interpretation (V.I.)

As indicated in table 5, the level of criminology instructional competence of faculty across campuses in Cabanatuan City, Nueva Ecija has the average weighted mean of 3.38 (SD = 0.47), interpreted as Highly Competent, indicates that respondents generally assessed their instructional competence favorably. This rating reflects the faculty's reported practices across lesson planning, teaching, practical activities, technology use, and assessment; it does not independently measure classroom performance.

Three statements shared the highest weighted mean of 3.53 and were all interpreted as Highly Competent: aligning learning outcomes, subject matter, activities, and assessment in lesson plans (SD = 0.61); selecting teaching strategies suited to criminology topics and student needs (SD = 0.57); and explaining legal theories and criminological concepts in relation to criminal justice practice (SD = 0.55). Together, these ratings suggest that respondents perceived planning and explaining criminology content as particular strengths. Hristov et al. (2023) describe the alignment of intended outcomes, learning activities, and assessment as a way to organize instruction toward what students were expected to learn. Integrating digital legal databases, open-source records, or cloud platforms into demonstrations of modern criminal investigation procedures received the lowest weighted mean (WM = 3.21, SD = 0.63), interpreted as Competent. Although the rating remains favorable, it was lower than the ratings for planning and delivering instruction. This suggests an area where faculty may benefit from more practice in designing technology-supported investigative activities. Kummer et al. (2022) demonstrate how digital tools can be incorporated into problem-based forensic learning activities, while Haarala-Muhonen et al. (2023) emphasize the value of connecting digital tools with teaching methods that actively support learning.

4. Significant Relationship Between Digital Competence and Criminology Instructional Competence

Table 6. Pearson r Correlation Between Digital Competence and Criminology Instructional Competence

Correlations		
		Faculty Digital Competence
Criminology Instructional competence	Pearson Correlation	.640**
	Sig. (2-tailed)	0.000
	N	80
** Correlation is significant at the 0.01 level (2-tailed).		

Table 6 shows a significant positive relationship between faculty digital competence and criminology instructional competence, $r(78) = .640$, $p < .001$, based on 80 respondents. The correlation indicates that faculty who reported higher digital competence also tended to report higher instructional competence. Thus, the null hypothesis of no significant relationship was rejected. The finding was consistent with the view that digital pedagogy involves using technology purposefully to support teaching and learning (Rawat et al., 2024). However, the correlation does not establish that digital competence causes higher instructional competence.



5. Do Faculty Digital Competence and Institutional Challenges Significantly Predict Criminology Instructional Competence?

Table 7. Multiple Linear Regression Analysis on Faculty Digital Competence and Institutional Challenges as Predictors of Criminology Instructional Competence

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.09	0.365		2.983	0.004
Faculty Digital Competence	0.696	0.095	0.637	7.292	0.000
Institutional Challenges	-0.045	0.056	-0.07	-0.799	0.427
Dependent Variable: Criminology Instructional competence					

Faculty digital competence was a significant positive predictor of criminology instructional competence controlling for institutional challenges ($B = 0.696$, $\beta = .637$, $t = 7.292$, $p < 0.001$) (see Table 6). For each 1 point increase in digital competence score, the predicted instructional competence score increases by 0.696 points. This finding aligns with Tzafilkou et al. (2023) who conceptualize teachers' digital competence as the application of digital skills in the design, implementation and assessment of teaching.

Institutional challenges do not significantly predict criminology instructional competence when controlling for faculty digital competence ($B = -0.045$, $\beta = -.070$, $t = -0.799$, $p = .427$). The negative coefficient cannot be interpreted as evidence that institutional challenges reduce instructional competence. Cook et al. (2023) explain that the available resources and institutional context can influence the use of digital competence in teaching by educators but the current data does not show a statistically significant independent contribution from the institutional challenges score.

Enhancement Program Framework to Support Faculty Digital Competence and Mitigate Institutional Challenges in Criminology Instruction

The Proposed "Enhancement Program Framework to Support Faculty Digital Competence and Mitigate Institutional Challenges in Criminology Instruction" is directly anchored in the empirical findings of this study, serving as a targeted intervention to address specific pedagogical gaps and institutional limitations. The empirical data highlights urgent instructional priorities, specifically faculty digital competence in utilizing Open-Source Intelligence (OSINT) in teaching ($WM = 3.05$), which registered the lowest digital competence rating, and the integration of digital investigative tools, databases, and cloud platforms ($WM = 3.21$), which received the lowest instructional competence rating. To systematically resolve these gaps, the framework introduces hands-on OSINT workshops, applied case exercise development, and peer-reviewed practice lessons designed to elevate instructional standards in line with modern criminal investigation practices.

Beyond faculty development, the framework addresses severe institutional constraints that hinder effective digital delivery. Unstable internet connectivity and power interruptions were identified as the most critical institutional challenge ($WM = 2.70$). To maintain instructional continuity during service disruptions, the framework integrates proactive measures such as offline downloadable case files, pre-packaged digital resources, and alternative submission protocols. Concurrently, the framework leverages established



institutional strengths—notably the high adherence to data privacy requirements (WM = 3.54) by embedding mandatory privacy and ethics reviews across all newly created OSINT and digital case materials.

Lastly, replacing abstract expected outcomes with a structured proposed budget converts

Proposed Criminology Digital Instruction Enhancement Program Framework					
Priority area and findings	Program objective	Enhancement activities	Persons involved	Time frame	Proposed Budget
OSINT in teaching: Using open-source intelligence to develop investigative examples received the lowest digital competence rating (WM = 3.05).	Strengthen faculty skills in finding, evaluating, and using publicly available information for criminology lessons.	Conduct an OSINT workshop and develop applied case exercises.	Program head, criminology faculty, invited investigation or digital forensics practitioner	Months 1–2	₱12,000.00 (Resource speaker honorarium: ₱8,000; Workshop materials & meals: ₱4,000)
Digital investigative demos: Integrating digital legal databases, open-source records, and cloud platforms received the lowest instructional competence rating (WM = 3.21).	Improve the use of digital resources in demonstrating criminal investigation procedures.	Develop demonstration materials and conduct peer-reviewed practice lessons linked to course learning outcomes.	Criminology faculty, program head, ICT personnel	Months 2–4	₱15,000.00 (Database/ software subscriptions & cloud storage allocation: ₱10,000; Peer review materials: ₱5,000)
Internet and power reliability: Unstable connectivity and power interruptions were the highest-rated institutional challenge (WM = 2.70).	Maintain instructional continuity during internet or power interruptions.	Prepare downloadable case files, offline activities, and alternative submission procedures.	Campus administrators, ICT personnel, facilities personnel, criminology faculty	Months 1–3; reviewed each term	₱20,000.00 (Offline storage drives/ external HDDs, backup router prep, offline module printing)
Data privacy in digital activities: Adherence to data privacy requirements was the highest-rated digital competence item (WM = 3.54).	Apply this reported strength to newly developed OSINT exercises and digital case materials.	Review case exercises for sensitive information and use anonymized or fictionalized details where appropriate.	Criminology faculty, program head, designated data privacy personnel	Through out implementation	₱3,000.00 (Data privacy review sessions & compliance documentation supplies)
Monitoring and evaluation: The targeted items identify areas for improvement, but the proposed activities have not yet been tested.	Assess whether the program addresses the identified instructional needs.	Review outputs, gather student feedback, and re-test metrics.	Program head, research coordinator, criminology faculty, ICT personnel	End of the term	₱5,000.00 (Evaluation forms, data analytics processing, binding of report outputs)
Total Estimated Budget					₱55,000.00

the framework from a conceptual model into an actionable, policy-ready administrative proposal. Clearly detailing resource allocations across capacity building, offline infrastructure support, privacy compliance, and end-of-term monitoring ensures that the



proposed interventions are financially transparent, achievable, and sustainable for program heads and campus administrators.

V. Summary of Findings, Conclusions, and Recommendations

This chapter presents the summary, conclusions based on the data gathered, presented, analyzed, and interpreted. Moreover, it presents recommendations based on the results of the study.

Summary

This study examined the faculty digital competence and institutional challenges to criminology instructional competence across campuses in Cabanatuan City, Nueva Ecija. Specifically, it determined the level of digital competence of criminology faculty, the institutional challenges they encountered, their level of criminology instructional competence, the relationship between digital competence and instructional competence, the predictive contribution of digital competence and institutional challenges to instructional competence, and the possible enhancement program that may be developed based on the findings of the study.

The study involved 80 respondents from the criminology faculty across the campuses included in the study. Data were analyzed using weighted mean, standard deviation, Pearson correlation, and multiple linear regression analysis.

For the first statement of the problem, the findings revealed that the criminology faculty had a high level of digital competence, with an overall weighted mean of 3.45 (SD = 0.43), interpreted as Highly Competent. Among the indicators, adherence to statutory data privacy requirements when storing or publishing student academic work obtained the highest mean of 3.54 (SD = 0.57). This indicates that respondents perceived responsible handling and protection of student information as one of their stronger digital practices. On the other hand, the use of open-source intelligence (OSINT) techniques and online public records to develop practical investigative examples obtained the lowest weighted mean of 3.05 (SD = 0.76), interpreted as Competent. Although still positively rated, this result identifies OSINT application as an area that may benefit from further development.

For the second statement of the problem, the findings showed that the respondents generally did not perceive the listed institutional conditions as major challenges, with an overall weighted mean of 2.48 (SD = 0.74), interpreted as Slight Challenge. However, some conditions were still identified as challenges. The highest-rated institutional challenge was unstable campus internet connectivity and frequent power interruptions, with a weighted mean of 2.70 (SD = 0.91), interpreted as Serious Challenge. Meanwhile, the lowest-rated challenge was inconsistent institutional policies and guidelines regarding technology integration across departments or satellite campuses, with a weighted mean of 2.33 (SD = 0.89), interpreted as Slight Challenge.

For the third statement of the problem, the respondents reported a high level of criminology instructional competence, with an overall weighted mean of 3.38 (SD = 0.47), interpreted as Highly Competent. The highest weighted mean of 3.53 was shared by three indicators: planning instruction by aligning learning outcomes, subject matter, learning activities, and assessment methods; selecting appropriate teaching strategies suited to criminology topics and student needs; and delivering criminology lectures clearly and accurately by connecting legal theories and criminological concepts with actual criminal justice practices. Meanwhile, integrating digital legal databases, open-source records, or cloud platforms into classroom demonstrations of modern criminal investigation procedures obtained the lowest weighted mean of 3.21 (SD = 0.630, interpreted as Competent.



For the fourth statement of the problem, the findings revealed a significant positive relationship between faculty digital competence and criminology instructional competence. The Pearson correlation coefficient was $r = 0.640$, with $p < 0.001$, based on 80 respondents. Since the result was statistically significant at 0.01 level, the null hypothesis stating that there was no significant relationship between faculty digital competence and criminology instructional competence was rejected. The result indicates that faculty members who reported higher levels of digital competence also tended to report higher levels of instructional competence. However, the correlation does not establish a cause-and-effect relationship.

For the fifth statement of the problem, regression analysis showed that faculty digital competence significantly predicted criminology instructional competence when institutional challenges were controlled. Faculty digital competence obtained an unstandardized coefficient of $B = 0.696$, standardized beta of $\beta = 0.637$, $t = 7.292$, and $p < 0.001$. This indicates that digital competence made a significant positive contribution to the prediction of instructional competence. In contrast, institutional challenges did not significantly predict criminology instructional competence, with $B = -0.045$, $\beta = -0.070$, $t = -0.799$, and $p = 0.427$. Therefore, the institutional challenges score did not demonstrate a statistically significant independent contribution to instructional competence in the regression model.

Finally, based on the findings, a Proposed Criminology Digital Instruction Enhancement Program Framework was developed. The framework focuses on the areas with the lowest ratings, particularly the use of OSINT in teaching and the integration of digital legal databases, open-source records, and cloud platforms into instructional demonstrations. It also addresses the most strongly reported institutional challenge, which was unstable internet connectivity and power interruptions. The proposed activities include OSINT workshops, development of investigative case exercises, peer-reviewed digital demonstrations, preparation of offline instructional materials, alternative submission procedures, and continuous monitoring and evaluation. The framework also builds upon existing strengths, particularly the faculty's reported adherence to data privacy requirements and strong instructional planning practices.

VI. Conclusions

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

- The criminology faculty demonstrated a high level of digital competence. The overall weighted mean of 3.45 indicates that the respondents generally perceived themselves as capable of using digital resources responsibly in teaching, communication, information management, and other academic activities. Their strongest reported practice was compliance with data privacy requirements, while the use of OSINT and public records for practical investigative examples was comparatively less developed.
- Institutional challenges were generally not perceived as major obstacles to criminology instruction. The overall weighted mean of 2.48 indicates that respondents generally perceived that the identified institutional conditions constituted slight challenges. Nevertheless, unstable internet connectivity and frequent power interruptions emerged as the most notable concern among the listed conditions, suggesting that instructional continuity may still be affected when technological access was disrupted.
- The criminology faculty demonstrated a high level of instructional competence. With an overall weighted mean of 3.38, respondents generally perceived themselves as competent in planning lessons, selecting appropriate teaching strategies, explaining criminological concepts, facilitating practical learning activities, assessing students, and providing feedback. However, the integration of digital legal databases, open-



source records, and cloud platforms into investigative demonstrations received the lowest rating and may therefore be an area for further enhancement.

- There was a significant positive relationship between faculty digital competence and criminology instructional competence. The correlation coefficient of $r = 0.640$ with $p < 0.001$ indicates that higher reported digital competence was associated with higher reported instructional competence. Thus, the null hypothesis was rejected. The finding, however, should be interpreted as an association and not as proof that digital competence directly causes higher instructional competence.
- Faculty digital competence significantly predicts criminology instructional competence, while institutional challenges do not significantly predict it in the regression model. The significant positive coefficient for faculty digital competence demonstrates its statistical contribution to instructional competence. Meanwhile, institutional challenges did not make a statistically significant independent contribution when digital competence was controlled. This indicates that the faculty's digital competence was more directly associated with variations in reported instructional competence within the model.
- There was a basis for implementing a targeted digital instruction enhancement program for criminology faculty. Although the overall ratings for digital and instructional competence were favorable, the comparatively lower ratings for OSINT use and digital investigative demonstrations identify specific areas where professional development can be directed.

Recommendations

Based on the findings and conclusions of the study, the following recommendations were presented:

- The criminology faculty should strengthen their digital competence through continuous training, particularly in the use of OSINT and online public records for developing practical investigative examples.
- The institution should address internet connectivity and power interruptions by improving technical support and preparing alternative resources to ensure continuity of criminology instruction.
- The criminology faculty should further develop their use of digital legal databases, open-source records, and cloud platforms in classroom demonstrations and investigative activities.
- The institution should provide opportunities for faculty to enhance their digital skills, as these were found to be significantly and positively related to reported instructional competencies.
- The institution should prioritize programs that strengthen faculty digital competence, given its significant contribution to criminology instructional competence, while continuing to monitor institutional challenges.
- The proposed Criminology Digital Instruction Enhancement Program Framework should be implemented and evaluated to determine its effectiveness in addressing the identified areas for improvement.

References

1. Abella, M. A., & Rosa, R. D. (2023). Digital literacy and competence as foundational pillars for post-pandemic pedagogy among Filipino educators. *Philippine Journal of Higher Education Development*, 12(2), 45–58. https://www.researchgate.net/publication/373788420_Digital_Literacy_and_Digital_Competence_of_Selected_Filipino_Teachers_Basis_for_a_Post-Pandemic_Pedagogy
2. Al-Qahtani, M. S. (2025). Institutional challenges in the adoption of immersive virtual simulations in higher education: Infrastructure, faculty competence, and technical



- support frameworks. *International Journal of Educational Technology and Research*, 28(1), 114–129.
<https://publications.immersivelrn.org/practitioner/article/view/1298>
3. Aying, R. Y. (2026). Instructional and digital competence of teachers in teaching Technology and Livelihood Education in Lapu-Lapu City. *PANTAO: The International Journal of the Humanities and Social Sciences*, 5(1), 8314–8325. <https://doi.org/10.69651/PIJHSS0501751>
 4. Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Muñoz, R., & Otto, A. (2022). University teachers' digital competencies: A systematic review of uneven capabilities across institutions. *International Journal of Educational Technology in Higher Education*, 19(1), 12–29. <https://link.springer.com/article/10.1186/s41239-021-00312-8>
 5. Besa, D. P., & Limpot, M. Y. (2023). TPACK, instructional competence, and teachers' attitude toward internet use: A structural equation model in readiness to teach online in Filipino. *Asian Journal of Education and Social Studies*, 46(2), 40–53. <https://doi.org/10.9734/ajess/2023/v46i21001>
 6. Blando, J. C. (2025). Determinants of successful ICT integration in education: The role of institutional support, policy alignment, and resource availability. *Journal of Educational Leadership and Governance*, 8(1), 102–115. <https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2025.1800315/full>
 7. Crompton, H., & Burke, D. (2023). Towards intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior*, 138, 107468. <https://doi.org/10.1016/j.chb.2022.107468>
 8. Damayon, A. (2022). Evaluating the integration of blended learning modalities in criminology programs: Faculty and student perspectives. *Philippine Journal of Educational Technology*, 14(2), 45–62. <https://rsisinternational.org/journals/ijriss/view/evaluating-the-integration-of-blended-learning-modalities-in-criminology-programs-faculty-and-student-perspectives>
 9. Dizon, J. (2026). Navigating the digital divide: The lived experiences of provincial higher education faculty in the Philippines. *Journal of Southeast Asian Educational Research*, 8(1), 112–129. DOI:10.9734/jemt/2026/v32i21393
 10. EDUCAUSE. (2023). EDUCAUSE QuickPoll on cybersecurity awareness and practices in higher education. EDUCAUSE Research and Publications. <https://er.educause.edu/articles/2023/10/educause-quickpoll-results-cybersecurity-awareness-and-practices-in-higher-education>
 11. Gayeta, M. L. (2025). Faculty attitudes, computer skills, and the utilization of educational technology among higher education instructors in Manila, Philippines. *The Philippine Social Science Review*, 77(1), 89–104. https://www.researchgate.net/publication/351073962_FACULTY_ATTITUDES_COMPUTER_SKILLS_AND_LEVEL_OF_USE_OF_EDUCATIONAL_TECHNOLOGY_TOWARD ICT_INTEGRATION_IN_HIGHER_EDUCATION_MANILA_PHILIPPINES
 12. Honicke, T., Broadbent, J., & Fuller-Tyszkiewicz, M. (2023). Academic self-efficacy and its relationship to digital competence and technology integration. *Journal of Educational Computing Research*, 61(4), 789–812. <https://files.eric.ed.gov/fulltext/EJ1449350.pdf>
 13. Hristov, S., & Nakov, D., & Miocinovic, J. (2023). CONSTRUCTIVE ALIGNMENT BETWEEN OBJECTIVES, TEACHING, AND LEARNING ACTIVITIES, STUDENT COMPETENCE, AND ASSESSMENT METHODS IN HIGHER EDUCATION. *Journal of Agriculture and Plant Sciences*. <https://doi.org/10.46763/JAPS23212021h>



14. Johnson, T. R., & Miller, L. E. (2024). Beyond productivity tools: Evaluating technological pedagogical content knowledge (TPACK) within specialized criminal justice and criminology instruction. *Journal of Criminal Justice Education*, 35(2), 201–218. DOI:10.31893/multirev.2025167
15. Kakooei, H., Rahmani, M., Alipour, A., & Soleimani, N. (2024). Deconstructing faculty digital literacy: Functional areas, troubleshooting capabilities, and tool mastery in modern universities. *Global Review of Educational Research*, 31(3), 210–224. DOI:10.17645/mac.8913
16. Karimi, A., & Khawaja, S. (2025). Navigating digital transformations: Institutional constraints and the digital competencies of higher education faculty. *Journal of Technology and Higher Education Policy*, 14(2), 88–101. DOI:10.26803/ijlter.24.1.15
17. Leung, K. Y., Ho, C. M., & Tam, L. F. (2026). Safeguarding institutional data: Cybersecurity awareness and data handling vulnerabilities among higher education faculty. *Computers & Security in Education*, 22(1), 15–32. <https://doi.org/10.1177/21582440251413473>
18. Licayan, R. H., & Arroyo, R. A. (2025). Instructional competence and its impact on the performance of public junior high school Technology and Livelihood Education teachers. *International Journal of Research and Innovation in Social Science*, 9(5), 75–101. <https://rsisinternational.org/journals/ijriss/articles/instructional-competence-and-its-impact-on-the-performance-of-public-junior-high-school-technology-and-livelihood-education-teachers/>
19. Mananay, J., Sanchez, J. M., Sumalinog, G., Goles, C., & Alejandro, I. M. (2024). Factors affecting technology use in teaching functions in higher education institutions: A regression analysis. *Journal of Education and Innovation*, 26(3), 46–58. https://www.researchgate.net/publication/383313494_FACTORS_AFFECTING_TECHNOLOGY_USE_IN_TEACHING_FUNCTIONS_IN_HIGHER_EDUCATION_INSTITUTIONS_A_REGRESSION_ANALYSIS
20. Manriquez, L. M. (2025). Beyond basic skills: Ongoing professional development and targeted training as drivers for faculty digital innovation. *The Southeast Asian Educator*, 17(4), 74–89. DOI:10.59613/global.v2i10.334
21. Moreira-Choez, J. S., Viteri-Rodriguez, J. A., & Burgos-Galarraga, M. E. (2024). Multidimensional assessment of digital competencies among higher education faculty: A self-perception framework. *Journal of New Approaches in Educational Research*, 13(1), 67–83. <https://doi.org/10.3389/feduc.2024.1425487>
22. Nobis, M., & Ballado, R., & Irinco, L., & Balanquit, C. (2026). Digital innovations in mathematics education: empowering teaching and learning. *Journal of Education and Learning (eduLearn)*. <https://doi.org/10.11591/edulearn.v20i3.23724>
23. Orbigoso, E. R., & Pontillas, M. S. (2025). Infrastructure gaps and limited professional development: Sustained technology integration challenges among local teachers. *Journal of Research in Innovative Teaching*, 9(2), 143–156. DOI:10.36948/ijfmr.2025.v07i04.52991
24. Patalinghug, R. C. (2024). Digital citizenship behaviors in tertiary education: Perspectives of faculty members on digital security, etiquette, and rights and responsibility. *Philippine Journal of Higher Education Futures*, 11(1), 74–88. https://www.researchgate.net/publication/393890905_Digital_Citizenship_Behaviors_in_Tertiary_Education_Perspectives_of_Faculty_Members_on_Digital_Security_Etiquette_and_Rights_and_Responsibility
25. Resol, V. (2022). Impact of cloud computing on the teaching competence among Information Technology (IT) faculty at Iloilo State College of Fisheries (ISCOF) System in the Philippines. *Journal of Higher Education Research Disciplines*, 7(1). <https://www.nmsc.edu.ph/ojs/index.php/jherd/article/view/187>



26. Reza, M., et al. (2022). Ethical and legal awareness in digital data sharing among law enforcement educators and practitioners. *Journal of Criminal Justice Education*, 33(4), 512-529. https://www.researchgate.net/publication/382017625_Ethical_and_Legal_Awareness_in_Digital_Data_Sharing_among_law_enforcement_educators_and-practitioners
27. Rung, I., Lazarides, R., Rubach, C., Richter, D., & Scheiter, K. (2023). Teacher-reported instructional quality in the context of technology-enhanced teaching. *Computers & Education*, 198, 104761. <https://doi.org/10.1016/j.compedu.2023.104761>
28. Schorr, A. (2023). The Technology Acceptance Model (TAM) and Its Importance for DIgitalization Research: A Review. <https://doi.org/10.2478/9788366675896-005>
29. Shi, L., Ding, A. C., & Choi, I. (2024). Investigating teachers' use of an AI-enabled system and their perceptions of AI integration in science classrooms: A case study. *Education Sciences*, 14(11), <https://doi.org/10.3390/educsci14111187>
30. Sinaga, O., et al. (2021). Digital competence and intelligence technology in criminal justice education. *International Journal of Cyber Criminology*, 15(2), 112-128. https://www.researchgate.net/publication/372438201_DIGITAL_COMPETENCE_A_ND_INTELLIGENCE_TECHNOLOGY_IN_CRIMINAL_JUSTICE_EDUCATION
31. Smith, J. A., & Al-Majali, M. (2024). Cybersecurity readiness in higher education: An empirical study of faculty data handling practices and security policy alignment. *Computers & Security*, 139, Article 103712. DOI:10.11591/ijere.v11i3.22863
32. Sumalinog, G. G. (2022). ICT skills enhancement training in teacher education: The case in Central Visayas, Philippines. *International Journal of Computing Sciences and Research*, 6(1), 112–126. DOI:10.33407/ijlt.v39i1.964
33. Sumile, G. T., & Lozano, P. V. (2025). Tool availability, infrastructure, and the functionality of ICT resources in shaping teachers' digital literacy skills. *Philippine Educational Review*, 40(1), 55–69. <https://www.ijmra.ijpbms.com/v8i5/Doc/42.pdf>
34. Ting, H., & Memon, M., & Ramayah, T., & Cheah, J. (2025). Snowball Sampling: A Review and Guidelines for Survey Research. *Asian Journal of Business Research*. <https://doi.org/10.4707/ajbr.250186>
35. Wilkins, S. (2024). Purposive Sampling in Qualitative Research: A Framework for the Entire Journey. *Quality and Quantity*. <https://doi.org/10.01007/S11135-024-02022-5>
36. Zakharevych, V., & Hryhorenko, O. (2024). Teaching modern police intelligence: Integrating AI, mobile forensics, and data analytics into the curriculum. *European Journal of Criminology*, 21(1), 45-63. <https://www.sciencedirect.com/science/article/abs/pii/S0379073824003785>