Development and psychometric evaluation of the Filipino Nurse-Educator Instructional Competency Scale: A tool for continuous quality improvement in nursing education

Luckyhansel R. Cerezo

Manuel V. Gallego Foundation Colleges, Inc., Cabanatuan City, Nueva Ecija, Philippines

Corresponding Author e-mail: *luckyhanselcerezo@gmail.com*

Abstract

Aim: This study aimed to develop and psychometrically evaluate the Filipino Nurse-Educator Instructional Competency Scale (NEICS) as a valid and reliable instrument aligned with quality assurance (QA) and continuous quality improvement (CQI) frameworks in nursing education.

Methodology: A methodological research design was employed involving 228 nurse educators from public and private colleges of nursing in selected provinces of Central Luzon, Philippines. Participants were selected through purposive sampling. Content validity was established through expert evaluation, construct validity was examined using exploratory factor analysis (EFA), and internal consistency reliability was assessed using Cronbach's alpha.

Results: From the initial pool of items, twenty were retained to form the final scale. Exploratory factor analysis revealed a unidimensional structure explaining 66.9% of the total variance. The NEICS demonstrated excellent internal consistency, with a Cronbach's alpha coefficient of 0.975.

Conclusion: The Filipino NEICS is a psychometrically sound instrument for assessing the instructional competencies of nurse educators in the Philippine context. It provides an evidence-based tool that supports institutional QA and CQI initiatives by enabling systematic faculty evaluation and informing targeted professional development and capability-building programs in nursing education.

Keywords: *instructional competency, nurse educator, quality assurance, continuous quality improvement, instrument validation, faculty development*

INTRODUCTION

In recent years, the global call for QA and CQI in higher education has intensified, reflecting the growing need to uphold accountability, institutional excellence, and sustainable outcomes in professional programs such as nursing. Within this framework, the competence of nurse educators has emerged as a critical determinant of instructional quality, student learning, and program effectiveness (Krouse et al., 2024; Lemetti et al., 2023). Nurse educators play a vital role in shaping the next generation of nurses, ensuring that their knowledge, skills, and values align with evolving healthcare demands and international standards of practice.

Although a growing body of research explores the transition from clinical practice to academia, most studies have focused broadly on lecturers across multiple disciplines rather than nurse educators specifically. Those that do address nursing education tend to conceptualize the transition as an individual identity shift rather than an institutional concern related to teaching competence and educational quality (Lemetti et al., 2023; Pajari et al., 2024). Prior investigations have largely emphasized faculty–student interactions in hospital-based clinical settings, such as preceptorship and clinical tutoring, leaving a significant gap in the literature regarding the instructional competencies of registered nurses as classroom educators, particularly in the context of higher education QA systems.

As nursing education institutions strive to meet accreditation standards and global benchmarks, the integration of CQI mechanisms into faculty evaluation and development processes has become imperative. QA frameworks emphasize the systematic measurement of teaching effectiveness and its linkage to learning outcomes, institutional performance, and continuous enhancement (Endalamaw et al., 2024). However, the absence of standardized, contextually grounded instruments for evaluating the instructional competencies of nurse educators—especially in

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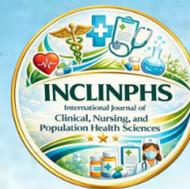
developing countries—limits the ability of institutions to make evidence-based decisions that drive quality improvements. Without such tools, evaluations risk inconsistency, subjectivity, and misalignment with institutional standards, hindering data-driven professional development and sustainability of educational excellence.

Nursing education in the Philippines operates within a highly regulated and performance-driven environment shaped by national QA mechanisms and accreditation standards. Higher education institutions offering nursing programs must comply with the policies and standards set by the Commission on Higher Education (CHED), particularly those governing outcomes-based education (OBE), faculty qualifications, curriculum alignment, clinical exposure requirements, and institutional performance indicators. In addition, nursing schools are subject to external accreditation processes conducted by recognized accrediting bodies such as AACCUP, PACUCOA, and ACSCU-AAI, which further reinforce expectations for continuous quality improvement, governance accountability, and academic excellence. Beyond regulatory compliance, nursing institutions face sustained public scrutiny through licensure examination performance, which serves as a key metric of program quality and institutional credibility. Board examination results significantly influence institutional reputation, student enrollment patterns, and even the long-term viability of nursing programs. Consequently, nursing education leaders must navigate complex accountability pressures while ensuring instructional quality, faculty development, student support systems, and clinical training effectiveness.

Within this broader Philippine context, understanding how institutions respond to QA and accreditation demands is critical. These external mandates shape not only administrative decision-making but also organizational culture, resource allocation, and strategic priorities. Situating this study within the realities of Philippine nursing education therefore underscores its practical and policy relevance. To address this gap, the present study developed and psychometrically evaluated the Filipino NEICS—a self-rated, standardized instrument designed to assess the instructional competencies of nurse educators in the Philippine context. The NEICS was developed using internationally recognized frameworks for instrument design and psychometric validation (Elliot et al., 2001; World Health Organization (WHO, 2022). It directly supports institutional QA and CQI by providing a reliable mechanism to evaluate faculty performance, identify areas for growth, and guide capability-building programs that enhance pedagogical effectiveness. By generating measurable data that inform accreditation readiness, curriculum innovation, and human-resource development, the NEICS contributes to institutional accountability and continuous improvement in nursing education.

Moreover, the NEICS aligns with the United Nations Sustainable Development Goals (SDGs)—particularly SDG 3 (Good Health and Well-Being), SDG 4 (Quality Education), and SDG 8 (Decent Work and Economic Growth)—by strengthening the competencies of educators responsible for training nurses to deliver safe, equitable, and high-quality care. It also directly supports SDG 4.3 (equal access to quality tertiary education) and SDG 4.c (increasing the supply of qualified teachers through international cooperation in teacher training). At the national level, the study contributes to the Philippines' AmBisyon Natin 2040 vision of matatag, maginhawa, at panatag na buhay para sa lahat (a strongly rooted, comfortable, and secure life for all). By promoting faculty professionalization and instructional excellence, the NEICS strengthens the country's human capital in both education and healthcare, fostering a more resilient and globally competitive workforce.

Aligned with these global and national priorities, this study aimed to develop and psychometrically evaluate the NEICS to ensure its validity and reliability as a tool for faculty assessment and professional growth. Specifically, it sought to establish the scale's content and construct validity and determine its internal consistency reliability. The NEICS represents a major contribution to the ongoing advancement of quality assurance and continuous quality improvement in nursing education—functioning not only as an evaluative instrument but also as a strategic mechanism for institutional capacity-building, reflective practice, and sustainable educational excellence, reinforcing the Philippines' commitment to both the SDGs and AmBisyon Natin 2040.

Review of Related Literature and Studies

As higher education institutions (HEIs) endeavor to remain competitive in a globalized academic environment, the differentiation of institutional quality increasingly depends on the technical expertise, practical knowledge, and professional motivation of their faculty members. In this regard, the NEICS aligns with QA frameworks that emphasize faculty competence as a critical determinant of instructional quality and student learning outcomes. Colleges of nursing, guided by philosophical orientations that value the holistic development of knowledge, skills, attitudes, and values, are expected to uphold excellence in instruction, research, and extension services—all contributing to the delivery of quality nursing education. Globalization has further accelerated the paradigm shift from static education to lifelong learning, highlighting the cultivation of students' competencies as a global priority. This shift compels nursing colleges to institutionalize CQI mechanisms, emphasizing continuous professional growth, capability-building, and innovation in instructional practices to sustain educational relevance and excellence.
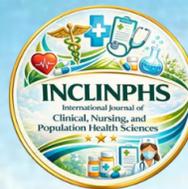
Experienced nurses who transition into academia often do so with a strong desire to contribute to the formation of future nurses (Brower et al., 2022; Kline, 2024; Shajani, 2020). Despite their clinical expertise, many of these professionals encounter challenges adapting to academic roles due to the absence of formalized orientation programs or structured pedagogical preparation (Barken & Robstad, 2024). This lack of organized preparation has been identified as a persistent challenge among nurses entering education (Bvumbwe & Mtshali, 2018), as teaching requires a unique and specialized skill set distinct from clinical practice (Kyriacou, 2018). As a result, nurse educators may initially exhibit gaps in essential areas such as subject-matter mastery, pedagogical strategies, classroom management, learner diversity, curriculum and instructional design, assessment and evaluation, community engagement, and professional development. Many nurses-turned-educators have expressed enthusiasm for sharing their clinical expertise through teaching yet report feeling unprepared for the pedagogical and academic expectations of the role (Ball, 2017). Addressing these competency gaps is essential not only for instructional improvement but also for maintaining compliance with QA indicators and advancing the CQI cycle within nursing education institutions.

Competence refers to the essential skills, behaviors, and knowledge that enable an individual to perform effectively in a given role (Lilia & Elena, 2019). In nursing, competencies are contextualized across specialized domains of practice. For instance, the National League for Nursing (NLN) has outlined core competencies for clinical nurses, focusing on the provision of safe, effective, and evidence-based care through the integration of critical thinking, collaboration, and decision-making skills (Beauvais, 2018). These competencies emphasize the nurse's ability to understand patient needs, deliver appropriate care, engage in interdisciplinary collaboration, and make informed clinical judgments—abilities that are interdependent and universally applicable across nursing practice.

In contrast, nursing education requires a distinct yet complementary set of competencies designed to prepare the next generation of nurses. The professional preparation of nurse educators is critical in shaping students' cognitive, affective, and psychomotor development. As facilitators of learning, nurse educators bear the responsibility of transforming students into competent practitioners capable of providing safe and compassionate care. This role demands not only clinical expertise but also proficiency in curriculum design, instructional delivery, assessment, and educational leadership (Oermann et al., 2017; Summers, 2017). However, despite the centrality of teaching competence to nursing education, there is currently no universally accepted measure for assessing the overall instructional competency of nurse educators. Educational systems and competency expectations vary widely across countries, contributing to the absence of a global standard (Satoh et al., 2020). Nevertheless, efforts to improve and standardize teaching competencies remain critical for advancing the quality of nursing education and ensuring consistency in professional preparation worldwide—key goals that align with the principles of QA and CQI in higher education.

The World Health Organization (WHO, 2016) has identified eight core domains of competency for nurse educators, offering a comprehensive framework for expected performance. These include: theories and principles of adult learning; curriculum and implementation; nursing practice; research and evidence; communication, collaboration, and partnership; ethical and legal professionalism; monitoring and evaluation; and management, leadership, and advocacy. These domains encompass cognitive, affective, and psychomotor skills and behaviors expected of educators in nursing programs. The National League for Nursing (NLN) further distinguishes between competencies required of academic and clinical nurse educators. Academic nurse educators—typically faculty members in universities or higher education programs—emphasize classroom instruction, curriculum design, and outcome evaluation based on educational theory and research-informed methods (Angliengmene, 2020). In contrast, clinical nurse educators focus on facilitating learning in healthcare environments, ensuring that students acquire the confidence and competence necessary for effective patient care.

Clinical nurse educators are thus expected to demonstrate competencies such as facilitating learning in clinical settings, applying clinical expertise, fostering interprofessional collaboration, implementing curricula in compliance with ethical and institutional policies, supporting learner development, and utilizing effective assessment and evaluation strategies. Together, these competencies underscore the multifaceted nature of the nurse educator's role—one that demands a balance between clinical proficiency and pedagogical mastery.

Despite the increasing emphasis on QA and CQI in Philippine nursing education, there remains a notable absence of a standardized, validated instrument specifically designed to measure nurse-educators' instructional competence within the local context. Existing evaluation mechanisms in many institutions rely primarily on generic faculty performance appraisal tools, student satisfaction surveys, or administrative checklists that are not grounded in a comprehensive competency framework tailored to nursing instruction. While international instruments measuring teaching effectiveness exist, these tools are often developed within different regulatory, cultural, and pedagogical environments and may not fully capture the unique expectations, professional standards, and accreditation pressures faced by nurse educators in the Philippines. Furthermore, current QA processes mandated by the CHED and accreditation bodies
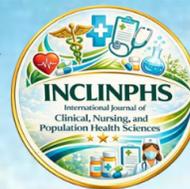
emphasize outcomes-based education, faculty qualifications, and instructional quality; however, there is limited empirical infrastructure to systematically and quantitatively assess instructional competency in a way that aligns with these standards. The absence of a psychometrically sound and contextually appropriate scale creates a gap between policy expectations and measurable practice. As a result, institutions may struggle to generate evidence-based insights that inform targeted faculty development, instructional enhancement strategies, and long-term quality planning. Hence, the present study contributes to the ongoing discourse on quality assurance and continuous quality improvement in nursing education by developing and validating the NEICS. The scale aims to provide a valid, reliable, and contextually appropriate measure of instructional competence among nurse educators in the Philippines, thereby supporting evidence-based QA practices and sustainable CQI mechanisms. Through the establishment of this instrument, nursing institutions can systematically monitor instructional effectiveness, inform faculty development programs, and strengthen the institutional culture of continuous improvement and educational excellence.

Conceptual Framework

The research framework of this study was grounded in the principles of methodological research and CQI as applied to the systematic development and validation of educational assessment instruments. Guided by the instrument design model of Elliot et al. (2001) and the Plan–Do–Check–Act (PDCA) quality assurance cycle, the framework (Figure 1) illustrates the sequential process undertaken to design, validate, and finalize the Filipino NEICS. This process ensured that the instrument achieved both psychometric soundness and alignment with institutional goals for instructional quality and accountability.

Phase 1: Item Generation and Scale Construction. The initial step involved synthesizing insights from existing literature to ground the study in established theory and to formulate a preliminary list of competency indicators that encapsulate the multiple roles of nurse educators. From this pool, 28 items were developed, each rated on a four-point Likert scale. This phase corresponds to the "Plan" stage of CQI, emphasizing systematic planning and operationalization of competencies into measurable indicators to support valid and actionable assessment.

Phase 2: Expert Validation and Content Refinement. A panel of experts in nursing education evaluated the scale for clarity, relevance, and essentiality using the Content Validity Ratio (CVR) and Item-Content Validity Index (I-CVI). Based on their feedback, revisions were made and redundant items were removed, resulting in a refined 20-item scale. This step reflects the "Do" stage of CQI, where stakeholder engagement and expert input serve as mechanisms for ensuring content fidelity and academic rigor.

Phase 3: Pilot Testing and Reliability Assessment. The revised scale was pilot-tested with nurse educators sharing similar characteristics to the target respondents. The internal consistency, measured using Cronbach's alpha, yielded a high coefficient ($\alpha = .975$), indicating excellent reliability. This phase represents the "Check" stage of CQI, where empirical testing confirms the stability and consistency of the instrument.

Phase 4: Construct Validation and Finalization. The final validation phase involved EFA with a larger sample of nurse educators to test the construct validity and underlying factor structure. The results confirmed a unidimensional model explaining 66.9% of the variance, validating the instrument's capacity to measure instructional competency effectively. This corresponds to the "Act" stage of CQI, ensuring that data-driven refinements enhance the tool's validity and alignment with institutional QA standards.
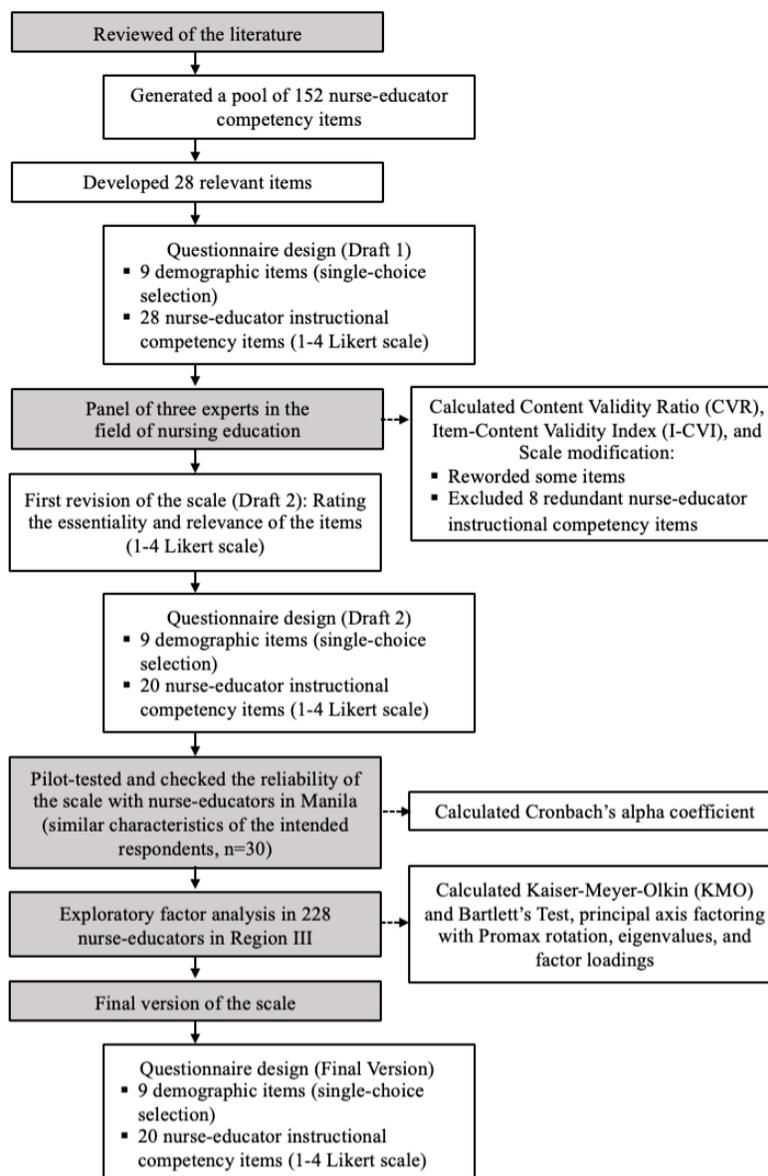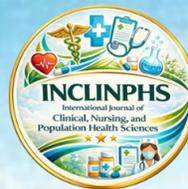
Figure 1. Research framework.

Statement of the Problem

The development of a psychometrically sound measurement scale requires rigorous and systematic validation procedures to ensure that the instrument accurately and reliably measures the intended construct. In the absence of adequate validation, results generated from such instruments may be misleading, potentially compromising the integrity of research findings, faculty evaluation processes, and QA and CQI initiatives within educational institutions. In nursing education, where instructional competence directly influences student learning outcomes and program quality, the use of non-validated assessment tools poses significant risks to evidence-based decision-making and institutional accountability.

Despite the increasing emphasis on QA and CQI in higher education, there remains a need for empirical validation of newly developed, context-specific instruments designed to assess nurse educators' instructional competencies. This study sought to address this gap by systematically examining the content validity, internal consistency reliability,
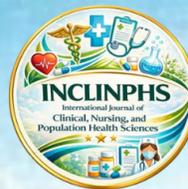
adequacy of assumptions prior to construct validation, and overall construct validity of the proposed NEICS. Establishing the psychometric soundness of the NEICS is essential to justify its use as a reliable and valid tool for faculty assessment and professional development within the specified population.

Research Objectives

General Objective

To establish the psychometric soundness of the NEICS by evaluating its content validity, reliability, assumption adequacy, and construct validity.

Specific Objectives

1. To test the content validity of NEICS.
2. To determine the reliability of NEICS.
3. To assess the statistical assumptions required prior to construct validation.
4. To examine the construct validity of NEICS.

Research Questions

1. Does the proposed scale demonstrate acceptable content validity?
2. Does the developed scale exhibit satisfactory reliability?
3. Are the statistical assumptions necessary for construct validation adequately met?
4. Does the developed scale demonstrate acceptable construct validity?

METHODS

Research Design

The researcher employed a methodological research design, which was deemed the most appropriate approach for this investigation. Methodological studies emphasize a systematic and structured process in the development, testing, and validation of research instruments, making this design particularly suitable for inquiries focused on establishing the reliability and validity of a newly developed scale. In this study, the design was operationalized in three sequential phases: development, validation, and finalization. During the development phase, the researcher conducted an extensive review of related literature, existing competency frameworks, and relevant regulatory standards in nursing education to generate an initial pool of items. These items were aligned with identified domains of instructional competency and were subjected to content review by subject matter experts to ensure conceptual clarity and contextual relevance. The validation phase involved both content and construct validation procedures. Content validity was established through expert panel evaluation using established indices (e.g., CVI/CVR), while construct validity was examined through statistical techniques such as exploratory factor analysis. Reliability testing was also conducted to determine internal consistency (e.g., Cronbach's alpha), ensuring that the scale demonstrated acceptable psychometric properties. Finally, the finalization phase involved refining and retaining items based on empirical results and expert feedback. Items that did not meet statistical or conceptual criteria were revised or removed, resulting in the finalized version of the Nurse-Educators' Instructional Competency Scale (NEICS). Through this structured and sequential process, the methodological design ensured that the instrument was both theoretically grounded and empirically robust.

Population and Sampling

A purposive sampling technique was utilized to identify and select respondents from various colleges of nursing across Central Luzon. Participants were selected based on the following criteria at the time of data collection: (1) the respondent must be a registered nurse holding a valid Professional Regulation Commission (PRC) license; (2) must have been employed as a clinical nurse in a hospital for at least one year; (3) must be currently employed as a faculty member in either a government-run or private college of nursing in Central Luzon; and (4) must have at least one year of teaching experience in a classroom and/or clinical setting. According to Tabachnick and Fidell (2007), a sample size of approximately 150 respondents is sufficient for such an undertaking. To strengthen the robustness of the results, a total of 228 respondents (Table 1) voluntarily participated in this study, exceeding the minimum required number of cases by 52%.
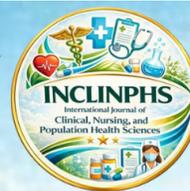
Table 1
Respondents of the study

| Indicator	Percent	Indicator	Percent
Age (x=38.9±10.3)		Province	
≤35 years	53.5%	Bulacan	3.5%
>35 years	46.5%	Nueva Ecija	5.3%
Sex at birth		Pampanga	41.2%
Female	66.7%	Zambales	50.0%
Male	33.3%	Employment status	
Civil status		Contractual	56.1%
Married	63.2%	Permanent	30.7%
Never been married	35.1%	Probationary	13.2%
Widow/Widower	1.8%	Teaching hours/week	
Years of hospital experience		≤6 hours	54.4%
≤11 years	50.9%	>6 hours	45.6%
>11 years	49.1%	R.L.E. hours/week	
Type of institution		≤14 hours	48.2%
Private	50.0%	>14 hours	51.8%
Public	50.0%		

Instrument

The primary instrument used in this study was the Nurse-Educators' Instructional Competency Scale, a structured questionnaire developed through a systematic, multi-phase process of item generation, expert validation, pilot testing, and psychometric analysis. The development of the instrument began with an extensive review of related literature, which generated an initial pool of 152 nurse-educator competency items. From this pool, 28 relevant instructional competency items were identified and organized into the first draft of the questionnaire (Draft 1). The initial questionnaire consisted of two parts: (1) nine demographic items presented in single-choice format, and (2) 28 instructional competency items measured using a four-point Likert scale. To establish content validity, the instrument was evaluated by a panel of three experts in nursing education. The experts assessed the essentiality and relevance of each item. As a result of this review, several items were reworded for clarity, and eight redundant instructional competency items were excluded. This process led to the second draft (Draft 2), which retained nine demographic items and reduced the instructional competency items to 20, all measured using a four-point Likert scale.

Data Collection

Data collection was conducted through the administration of a structured survey to the selected respondents. Using the identified sampling procedures, the finalized questionnaire was distributed to nurse educators across the participating institutions within the designated data collection period. The survey was administered either in printed form or through an online platform, depending on institutional access and respondent availability. Respondents were given clear instructions on how to complete the questionnaire and were provided sufficient time to answer all items. The researcher coordinated with designated institutional representatives to facilitate the orderly distribution and retrieval of the survey forms. Upon collection, the completed questionnaires were screened to ensure completeness and consistency of responses. Forms with substantial missing data were excluded based on predetermined criteria.

Treatment of Data

All collected data were systematically coded and entered into a digital spreadsheet prior to analysis. Statistical analyses were conducted using the Jamovi. To establish content validity, both the CVI and CVR were computed based on expert ratings. The internal consistency reliability of the instrument was assessed using Cronbach's alpha coefficient, with acceptable reliability determined according to conventional thresholds. Prior to conducting Exploratory Factor Analysis (EFA), the adequacy of the data for factor analysis was examined. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was computed, with a value greater than 0.60 considered acceptable. Additionally, Bartlett's Test of Sphericity was performed to determine whether the correlation matrix was suitable for factor extraction. Construct validity was assessed through Exploratory Factor Analysis (EFA) using Principal Axis Factoring (PAF) as the extraction method. Promax rotation was employed to allow for potential correlations among factors. The determination of the appropriate factor structure was guided by the criteria of eigenvalues greater than 1.0 and factor loadings of at least 0.40 (Hooper, 2012).
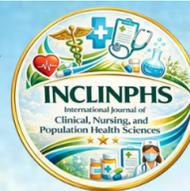
Items that failed to meet these criteria were removed iteratively. The process continued until a stable and interpretable factor structure was achieved, resulting in the final validated version of the scale.

Ethical Considerations

The researcher ensured that the rights and welfare of participants were fully protected. A formal letter requesting permission to conduct the study was secured from the respective academic officials of the participating colleges of nursing. Following approval, each respondent provided informed consent prior to participation. Before obtaining consent, the researcher explained the purpose and scope of the study, potential risks and benefits, and the participants' rights during research participation through the Google Form used for data collection. Furthermore, respondents were assured that all identifying information would remain confidential and that no personal data would appear in the final manuscript.

RESULTS and DISCUSSION

1. Testing the content validity of the scale

Content validity constitutes a foundational stage in scale development, as it determines the extent to which instrument items adequately represent the theoretical construct under investigation. It operationalizes abstract conceptual domains into observable indicators and ensures that the content domain of the construct is comprehensively and appropriately captured (Almanasreh et al., 2019). Establishing content validity is particularly critical in newly developed instruments, where empirical structure has yet to be confirmed. In the present study, content validity was evaluated using both qualitative expert judgment and quantitative analysis through the Content Validity Ratio (CVR) based on Lawshe's (1975) method. The CVR quantifies the proportion of subject matter experts who rate an item as essential. For a panel of three experts, Lawshe's critical value table indicates that items must exceed a CVR threshold of 0.49 to be considered acceptable. The initial NEICS consisted of 28 instructional competency items. Following expert review, 17 items obtained a CVR value of 1.00, indicating unanimous agreement regarding their essentiality. This result demonstrates strong convergence in expert judgment and suggests that these items represent central and indispensable components of nurse-educators' instructional competency within the study context. The high level of agreement supports the conceptual adequacy and representational relevance of these retained items. In contrast, 11 items (Items 2, 4, 8, 10, 15, 16, 17, 18, 22, 24, and 25) yielded a CVR value of 0.33, reflecting partial agreement among experts. While these values fell below the acceptable threshold, the findings were interpreted not as evidence of irrelevance but as indicators of potential ambiguity, redundancy, or insufficient alignment with the construct definition. Accordingly, these items were subjected to revision to enhance clarity, precision, and theoretical congruence with the operational definition of instructional competency (see Table 2).

Table 2
CVR of the scale

	Ne	CVR	Decision		Ne	CVR	Decision
Item01	3	1	Accept	Item15	1	0.33	Revise
Item02	2	0.33	Revise	Item16	1	0.33	Revise
Item03	3	1	Accept	Item17	2	0.33	Revise
Item04	1	0.33	Revise	Item18	2	0.33	Revise
Item05	3	1	Accept	Item19	3	1	Accept
Item06	3	1	Accept	Item20	3	1	Accept
Item07	3	1	Accept	Item21	3	1	Accept
Item08	2	0.33	Revise	Item22	2	0.33	Revise
Item09	3	1	Accept	Item23	3	1	Accept
Item10	2	0.33	Revise	Item24	2	0.33	Revise
Item11	3	1	Accept	Item25	2	0.33	Revise
Item12	3	1	Accept	Item26	3	1	Accept
Item13	3	1	Accept	Item27	3	1	Accept
Item14	3	1	Accept	Item28	3	1	Accept

To further evaluate item relevance and clarity, the CVI was computed following the procedures described by Zamanzadeh et al. (2015). The CVI provides a quantitative estimate of expert agreement regarding the relevance and clarity of each item in relation to the construct being measured. Specifically, the Item-level I-CVI was calculated by dividing the number of experts who rated an item as either quite relevant or highly relevant (scores of 3 or 4 on a
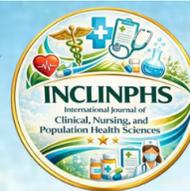
four-point scale) by the total number of evaluators. This proportion reflects the degree of consensus among experts concerning the adequacy of each item. In addition to the I-CVI, the S-CVI was computed to determine the overall content validity of the instrument (see Table 3). The S-CVI provides an aggregate measure of content representativeness across all items and serves as an indicator of the extent to which the scale, as a whole, captures the intended construct domain. Based on the criteria outlined by Yusoff (2019), when the panel consists of three validators, an I-CVI value of 1.00 is required for an item to be considered acceptable. This stringent threshold reflects the increased probability of chance agreement when the number of experts is small; thus, complete agreement among validators is necessary to ensure robust content validity. The study ensured that only items demonstrating full expert consensus were retained without revision, while those failing to meet the standard were subjected to further refinement. Consequently, the CVI analysis strengthened the precision, clarity, and construct alignment of the NEICS prior to subsequent reliability and factor-analytic testing.

Table 3
CVI of the scale

	A	B	C	Agreement	I-CVI	UA	Interpretation
Item01	1	1	1	3	1	1	Appropriate
Item02	1	1	1	3	1	1	Appropriate
Item03	1	1	1	3	1	1	Appropriate
Item04	1	1	0	2	0.67	0	Eliminate
Item05	1	1	1	3	1	1	Appropriate
Item06	1	1	1	3	1	1	Appropriate
Item07	1	1	1	3	1	1	Appropriate
Item08	1	1	0	2	0.67	0	Eliminate
Item09	1	1	0	2	0.67	0	Eliminate
Item10	1	0	1	2	0.67	0	Eliminate
Item11	1	1	1	3	1	1	Appropriate
Item12	1	1	1	3	1	1	Appropriate
Item13	1	1	1	3	1	1	Appropriate
Item14	1	1	1	3	1	1	Appropriate
Item15	1	1	1	3	1	1	Appropriate
Item16	1	0	1	2	0.67	0	Eliminate
Item17	1	0	1	2	0.67	0	Eliminate
Item18	1	1	1	3	1	1	Appropriate
Item19	1	0	1	2	0.67	0	Eliminate
Item20	1	0	1	2	0.67	0	Eliminate
Item21	1	1	1	3	1	1	Appropriate
Item22	1	1	1	3	1	1	Appropriate
Item23	1	1	1	3	1	1	Appropriate
Item24	1	1	1	3	1	1	Appropriate
Item25	1	1	1	3	1	1	Appropriate
Item26	1	1	1	3	1	1	Appropriate
Item27	1	1	1	3	1	1	Appropriate
Item28	1	1	1	3	1	1	Appropriate
Proportion	1	0.82	0.89	S-CVI/ Ave	0.90		
Average Proportion of items		0.90	S-CVI/UA		0.71		

Of the 28 items evaluated, 20 attained an I-CVI value of 1.00, indicating unanimous agreement among the expert panel regarding their relevance and clarity. This complete consensus suggests that these items were perceived as both conceptually aligned with the operational definition of nurse-educator instructional competency and clearly articulated for accurate measurement. Such agreement strengthens confidence that the retained items appropriately capture essential dimensions of the construct within the study context. Conversely, eight items (Items 4, 8, 9, 10, 16, 17, 19, and 20) yielded I-CVI values below the prescribed threshold and were therefore excluded from the instrument. The removal of these items reflects a rigorous adherence to established content validity criteria and minimizes the inclusion of statements that may introduce ambiguity, redundancy, or insufficient construct alignment. Therefore, the CVI findings provide empirical support for the content representativeness of the retained
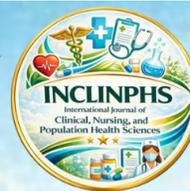
items. The final pool of items demonstrates strong expert consensus and satisfactory content validity, thereby enhancing the conceptual precision and measurement integrity of the Nurse-Educators' Instructional Competency Scale prior to subsequent psychometric evaluation.

2. Testing the reliability of the scale

Cronbach's alpha (α) (see Table 4) was computed to assess the internal consistency reliability of the NEICS. Internal consistency refers to the extent to which items within a scale are interrelated and collectively measure the same underlying latent construct. Cronbach's alpha estimates the proportion of total variance in observed scores attributable to true score variance, thereby providing an index of scale homogeneity and measurement stability. Established methodological literature suggests that alpha coefficients ranging from 0.70 to 0.95 reflect acceptable to excellent internal consistency (Bland & Altman, 1997; DeVellis, 2003; Nunnally & Bernstein, 1994). In the present study, item-level reliability coefficients ranged from .973 to .975, while the overall scale achieved a Cronbach's alpha of .975. This value indicates exceptionally high internal consistency and suggests a strong degree of inter-item correlation. The magnitude of the alpha coefficient demonstrates that the NEICS items function cohesively in capturing the intended construct of nurse-educator instructional competency. The minimal dispersion in item reliability values further indicates uniform contribution of items to the overall scale. Collectively, these findings provide robust evidence of scale reliability, confirming that the NEICS operates as a stable and internally consistent instrument suitable for assessing instructional competency among nurse educators.

Table 4
Item and scale reliability test

Item Reliability	If item dropped Cronbach's α	Item Reliability	If item dropped Cronbach's α
Item01	0.973	Item11	0.974
Item02	0.974	Item12	0.973
Item03	0.974	Item13	0.974
Item04	0.975	Item14	0.974
Item05	0.974	Item15	0.974
Item06	0.974	Item16	0.973
Item07	0.974	Item17	0.975
Item08	0.974	Item18	0.974
Item09	0.973	Item19	0.975
Item10	0.973	Item20	0.975

Scale reliability statistics using Cronbach's alpha is .975.

3. Testing the assumptions prior to construct validation

Prior to conducting EFA, the adequacy of the sample and the suitability of the correlation matrix for factor extraction were assessed using the KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO statistic evaluates whether the partial correlations among variables are sufficiently small, indicating that patterns of correlations are compact enough to yield reliable and distinct factors. In contrast, Bartlett's Test of Sphericity examines whether the observed correlation matrix significantly differs from an identity matrix, where variables would be unrelated and therefore unsuitable for factor analysis (Mikkelsen, 2019). The analysis revealed a KMO value exceeding the recommended minimum threshold of 0.60, indicating that the sample size and inter-item correlations were adequate for factor analytic procedures. A higher KMO value reflects a stronger common variance among variables, suggesting that the data structure is appropriate for identifying underlying latent dimensions. Furthermore, Bartlett's Test of Sphericity produced a statistically significant result ($p < .05$), leading to the rejection of the null hypothesis that the correlation matrix is an identity matrix. This finding confirms that sufficient correlations exist among the items to justify factor extraction. Collectively, these results provide empirical support for the factorability of the dataset. The demonstrated sampling adequacy and statistically significant inter-item correlations affirm that the application of EFA was methodologically appropriate and that the data were suitable for examining the underlying construct structure of the NEICS.
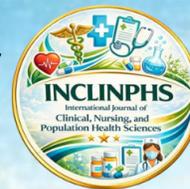
Table 5
Results of the KMO measure of sampling adequacy and Bartlett's test

Test		Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.916
Bartlett's Test of Sphericity	Approx. Chi-Square	5483
	df	190
	Sig.	<.001

4. Testing the construct validity of the scale

Deciding on the number of factors. Construct validity was examined through EFA to determine the underlying factor structure of the instrument. Two established criteria were employed to identify the appropriate number of factors to retain. First, Cattell's scree test was utilized by plotting the eigenvalues against the number of extracted factors (Woods & Edwards, 2011). The scree plot (Figure 2) was visually inspected to identify the point at which the curve levels off, indicating diminishing returns in explained variance. Visual examination of the scree plot revealed a clear point of inflection—or "elbow"—at Factor 1, after which the eigenvalues demonstrated a marked decline and subsequent plateau. This pattern suggests that the first factor accounts for a substantial proportion of the total variance, while additional factors contribute minimal incremental explanatory power. The dominance of the first factor and the absence of distinct secondary breaks in the curve support the appropriateness of a unidimensional solution. The identification of a single dominant factor indicates that the NEICS items converge on a common latent construct, consistent with the theoretical assumption that instructional competency among nurse educators can be conceptualized as a cohesive and unified dimension. This finding provides empirical support for the structural integrity of the scale and reinforces its construct validity within the study context.
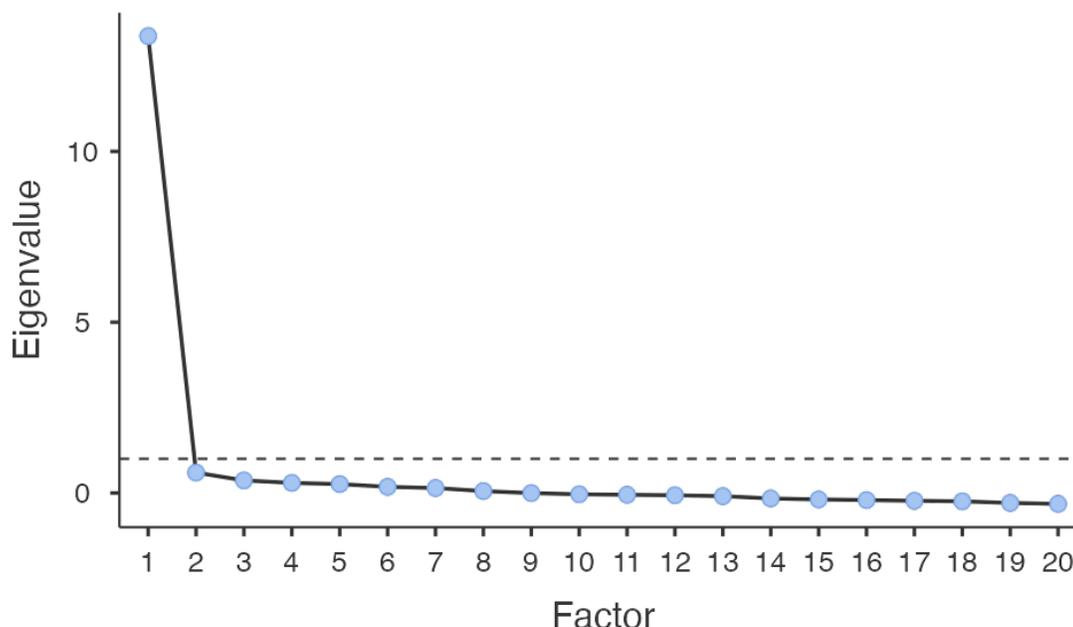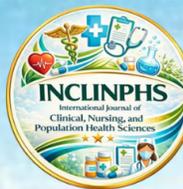

Figure 2. Cattell's scree test.

Second, the Kaiser criterion was employed to complement the scree test analysis. This method recommends retaining factors with eigenvalues greater than 1.0, as such factors explain more variance than a single observed variable (Fabrigar et al., 1999). As presented in Table 6, only one factor yielded an eigenvalue exceeding the 1.0 threshold. The remaining factors produced eigenvalues below this criterion, indicating insufficient explanatory contribution to warrant retention. The retained factor accounted for 66.9% of the total variance, exceeding the commonly accepted benchmark of 60% for a strong unidimensional construct in social science research. This

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substantial proportion of explained variance suggests that the majority of shared variance among the items can be attributed to a single underlying latent dimension. The convergence of findings from both Cattell's scree test and the Kaiser eigenvalue criterion provides robust empirical justification for adopting a one-factor solution. The consistency across these two independent retention methods strengthens confidence in the structural coherence of the instrument and supports the interpretation of the NEICS as measuring a single, unified construct of nurse-educator instructional competency.

Table 6
Factors and eigenvalues

Factor	Eigenvalue	Factor	Eigenvalue
1	13.37687	11	-0.05243
2	0.59649	12	-0.06737
3	0.36753	13	-0.09332
4	0.29436	14	-0.16124
5	0.25974	15	-0.18991
6	0.18000	16	-0.20770
7	0.14429	17	-0.22813
8	0.05486	18	-0.24403
9	-0.00349	19	-0.29177
10	-0.03793	20	-0.31966

Factor rotation and interpretation. Prior to interpreting the extracted factor, the dataset was examined for potential cross-loadings. Cross-loading is defined as a situation in which an item demonstrates substantial loadings (≥ .40) on more than one factor, thereby compromising interpretive clarity and factorial distinctiveness. The absence of cross-loadings is generally indicative of a well-defined factor structure in which items uniquely represent a single latent construct. As presented in Table 7, no cross-loadings were detected. All items demonstrated substantial loadings on the single extracted factor and did not exhibit meaningful secondary loadings on any additional dimensions. This clean loading pattern indicates strong factorial purity and suggests that the items converge coherently on one underlying construct. The absence of cross-loadings further reinforces the unidimensionality of the scale and provides additional empirical support for the structural validity of the NEICS. The clarity of the factor solution strengthens interpretability and confirms that the retained items function collectively as indicators of a singular instructional competency dimension.

Table 7
Pattern matrix of items and factor loadings

	Factor	Uniqueness
	1	
Item 01	0.899	0.191
Item 10	0.894	0.200
Item 12	0.867	0.249
Item 09	0.866	0.251
Item 16	0.862	0.257
Item 05	0.856	0.268
Item 08	0.850	0.277
Item 18	0.847	0.282
Item 15	0.843	0.289
Item 03	0.835	0.302
Item 13	0.833	0.307
Item 11	0.799	0.361
Item 07	0.793	0.371
Item 02	0.786	0.383
Item 14	0.778	0.395
Item 06	0.760	0.422
Item 19	0.754	0.431
Item 20	0.748	0.440
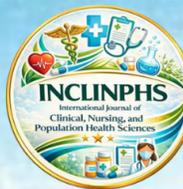
Item 17	0.741	0.451
Item 04	0.710	0.496

Extraction Method: Principal axis factoring.
Rotation Method: Promax with Kaiser Normalization.

The retained factor accounted for 66.9% of the total variance and comprised 20 items with factor loadings exceeding the established minimum criterion of 0.40. The magnitude of explained variance indicates a strong underlying common dimension, while the consistently substantial loadings demonstrate that each item contributes meaningfully to the latent construct. This factor was interpreted as representing the Instructional Competencies of Nurse Educators, reflecting the conceptual domain upon which the scale was theoretically grounded. Among the retained items, the statement "I apply the principles of teaching in nursing education" emerged as the strongest marker variable, exhibiting the highest loading coefficient ($\lambda = .899$). As a marker variable, this item serves as a central indicator of the construct, capturing the core pedagogical foundation of instructional competency. Its high loading suggests that mastery and application of teaching principles constitute a defining characteristic of effective nurse educators within the study context. Collectively, the factor structure indicates that the NEICS successfully operationalizes instructional competency as a cohesive and integrated construct. The retained items reflect interrelated dimensions of pedagogical knowledge, instructional effectiveness, and professional engagement, yet function together as manifestations of a single latent trait. The unidimensional solution provides empirical support for the theoretical assumption that instructional competency among nurse educators can be conceptualized as a unified construct, thereby affirming the construct validity of the scale.

Conclusions

The self-rated Filipino Nurse-Educators' Instructional Competency Scale demonstrated strong psychometric properties. Empirical analyses confirmed high internal consistency ($\alpha = .975$) and a clear unidimensional factor structure accounting for 66.9% of the total variance. All retained items exhibited substantial factor loadings ($> .40$) and no cross-loadings, supporting structural coherence and construct validity. These findings indicate that the 20-item NEICS functions as a reliable and conceptually unified measure of instructional competency among nurse educators within the Philippine context. The validated scale provides an objective mechanism for systematically assessing instructional competence in alignment with QA frameworks in higher education. Given the regulatory environment shaped by CHED standards, accreditation requirements, and outcomes-based education (OBE) principles, the NEICS offers institutions a standardized method for generating evidence on faculty instructional performance. Its demonstrated reliability and structural validity support its use in faculty evaluation, performance monitoring, and institutional reporting processes. Beyond assessment, the instrument enables data-informed decision-making for faculty development initiatives. Aggregate results can identify patterns of instructional strengths and areas requiring enhancement, thereby informing targeted professional development interventions. When integrated into institutional review cycles, the NEICS can support CQI efforts through systematic measurement and feedback mechanisms. Overall, the empirical findings establish the NEICS as a psychometrically sound and contextually appropriate instrument for measuring instructional competency among nurse educators. Its application provides a structured foundation for strengthening QA processes and advancing instructional quality in Philippine nursing education.

Recommendations

The findings of this study underscore the self-rated NEICS as a psychometrically sound instrument that may contribute meaningfully to institutional QA and CQI initiatives in nursing education. The NEICS offers an evidence-based framework for assessing the instructional competencies of nurse educators, thereby supporting systematic monitoring, evaluation, and enhancement of teaching performance across academic programs. Nursing education institutions may consider integrating the NEICS within their existing QA and CQI systems as part of routine faculty evaluation, curriculum review, and program assessment processes. The diagnostic information generated by the scale may inform strategic initiatives such as capability-building programs, mentoring structures, pedagogical training activities, and curriculum enhancement efforts. By identifying specific areas of instructional strength and areas for development, institutions may design data-informed faculty development plans that promote instructional excellence, accountability, and alignment with national accreditation standards and internationally recognized benchmarks in nursing education. At the policy level, accrediting agencies and educational regulators may explore the potential of the NEICS as a standardized instrument within broader QA frameworks for faculty competence evaluation. Its incorporation into accreditation or review processes may enhance consistency, transparency, and comparability in

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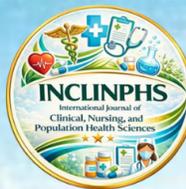
assessing instructional competencies across nursing programs. Furthermore, future research may undertake confirmatory factor analysis, longitudinal validation, and cross-institutional applications of the scale to strengthen its generalizability and establish normative benchmarks for instructional competency.

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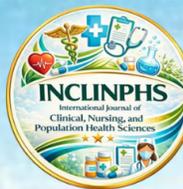
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