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Developing inclusive teacher education: A Stakeholder-driven feasibility study of ECE and SNED micro-credentials

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Abstract

This mixed-methods study examines the feasibility of implementing stackable micro-credential programs in Early Childhood Education (ECE) and Special Needs Education (SNED) at a Philippine university, responding to critical gaps in accessible teacher training. Combining needs assessment surveys (N=60), key informant interviews (n=10), and benchmarking of five leading universities, the research reveals strong demand for flexible upskilling, with 90% enrollment willingness and 65% preference for Master's-credit-bearing certificates. Stakeholders prioritized hybrid delivery (55% online, 37% blended), affordable pricing (₱20,000-25,000/~$350-440), and practical competencies like IEP design and play-based pedagogy. Benchmarking identified successful models integrating practicum requirements and ICT-enabled instruction, while institutional capacity analysis highlighted faculty readiness (5 qualified instructors) despite needing adjunct support for SNED supervision. Financial projections indicate sustainability, with Year 1 revenue (₱1.125M/~$19,500) exceeding operational costs by 125%. The study contributes to global conversations on micro-credentials by: (1) demonstrating their viability in resource-constrained contexts, (2) proposing a stakeholder-driven design framework adaptable to Global South institutions, and (3) addressing SDG4 targets for inclusive teacher training. Findings offer evidence for policymakers navigating the tension between standardization and localization in competency-based education reforms, particularly in Southeast Asia's evolving qualification landscapes.

Keywords: *inclusive education; micro-credentials; Philippines; stakeholder engagement; teacher training*

INTRODUCTION

The Philippine education system, guided by the MATATAG K–12 curriculum and Republic Act 7277 (Magna Carta for Persons with Disabilities), underscores the need for specialized teacher training in Early Childhood Education (ECE) and Special Needs Education (SNED). Robust evidence confirms that quality early childhood education yields significant medium- and long-term educational outcomes, underscoring the urgency of expanding accessible specialized training in regions like Northern Mindanao (McCoy et al., 2017). In Northern Mindanao, particularly Cagayan de Oro, a lack of accessible, competency-based programs limits professional development and inclusive education implementation (Abon et al.,

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2023). The importance of high-quality preschool experiences for building kindergarten readiness, especially among low-income and ethnically diverse children, has been empirically demonstrated in various contexts (Ansari & Winsler, 2016). To address this gap, Xavier University–Ateneo de Cagayan's School of Education (XU-SOE) proposes 21-unit ECE and 24-unit SNED certificate programs as micro-credentials aligned with global trends in flexible, stackable teacher training (UNESCO, 2022; Kato & Weko, 2023). These programs aim to equip in-service teachers, preservice educators, daycare workers, and psychology graduates with practical skills consistent with CHED standards (CHED, 2017).

Given the growing demand for such training and the need for localized, stakeholder-informed design, this study assesses the feasibility of these initiatives by examining stakeholder needs, best practices from Philippine universities, XU-SOE's institutional capacity, and financial viability. It addresses empirical gaps on micro-credential adoption and theoretical gaps in localizing global frameworks (Parilla et al., 2024; Varadarajan et al., 2023), positioning XU-SOE as a leader in innovative teacher education in Region X (Ang et al., 2021). The study employed a stakeholder-driven feasibility model encompassing stakeholder needs (via surveys and KIIs), benchmarking, and capacity analysis. Quantitative and qualitative data informed comparative and gap analyses against CHED standards. Expected outputs included program designs, capacity assessments, financial projections, and implementation strategies, ensuring methodological rigor and alignment with international micro-credential standards (Ashizawa et al., 2024; Parilla et al., 2024).

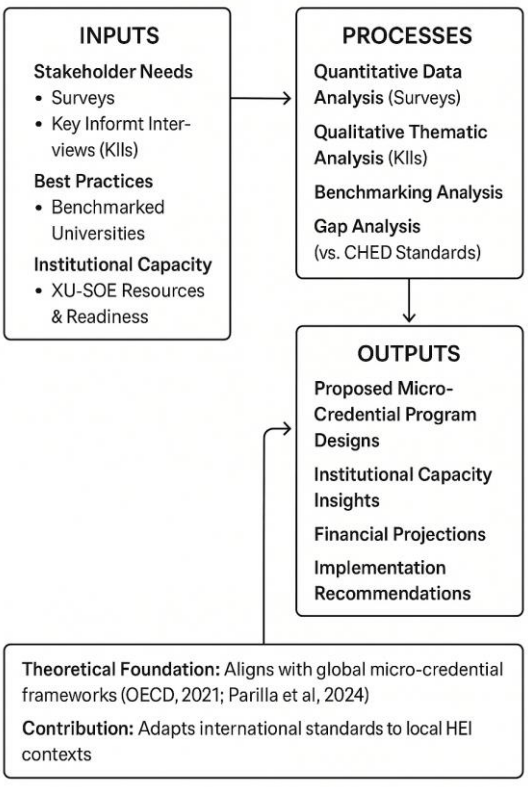

Figure 1. Stakeholder-driven feasibility model for localized micro-credential programs in ECE and SNED at the School of Education, Xavier University - Ateneo de Cagayan

The model illustrates the flow from stakeholder-informed inputs (needs, best practices, institutional capacity), through rigorous processes (quantitative, qualitative,

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benchmarking, and gap analyses), to strategic outputs (program designs, capacity insights, financial projections, and implementation plans), aligned with global micro-credential frameworks. The shortage of accessible, CHED-compliant ECE and SNED training programs in Northern Mindanao poses a significant barrier to professional development for educators, particularly in inclusive and early childhood settings. Many existing programs are centralized in Metro Manila or lack the flexibility needed for working teachers, limiting their ability to acquire specialized skills. Furthermore, there is a lack of localized data on stakeholder preferences for program design, delivery, and certification, as well as clarity on institutional capacity to deliver such programs.

This study addresses four key questions:

1. What are the stakeholder needs and preferences for ECE and SNED certificate programs in Region X?
2. What best practices from leading Philippine universities can guide program development?
3. Does XU-SOE have the faculty, technological, and administrative capacity to implement these programs?
4. Are the proposed programs financially viable?

By addressing these questions, the study filled methodological gaps through stakeholder-driven evidence and contextual gaps by focusing on Northern Mindanao's educational landscape (Abon et al., 2023; Bartolome et al., 2025). It offered evidence-based recommendations for XU-SOE's development of ECE and SNED certificate programs, strengthening its leadership in teacher education in the region.

Review of related literature

The global shift toward flexible, competency-based education has positioned micro-credentials as a transformative approach to professional development, particularly in teacher education. Micro-credentials, defined by UNESCO (2022) as "focused, short-term learning experiences that verify specific skills or competencies," offer a modular and stackable pathway for lifelong learning, aligning with Sustainable Development Goal 4 (SDG4) for inclusive and equitable education. This study examines the feasibility of micro-credential programs in Early Childhood Education (ECE) and Special Needs Education (SNED) at Xavier University–Ateneo de Cagayan, addressing critical gaps in accessible teacher training in Northern Mindanao, Philippines. This literature review critically synthesizes global and local research on micro-credentials, situating the study within a stakeholder-driven conceptual framework to highlight its novelty in applying international standards to a resource-constrained, localized context (Parilla et al., 2024; Kato & Weko, 2023).

Micro-credentials in higher education and teacher training

Micro-credentials have emerged as flexible, targeted pathways for modern learners, addressing evolving labor market demands (Ahsan et al., 2023). Ahsan's review highlights their role in bridging skill gaps through competency-based, stackable credentials that enhance employability and align with professional standards, though challenges remain in quality assurance and institutional recognition. In teacher education, micro-credentials effectively build specialized competencies. Kaufman et al. (2023) showed that Louisiana's initiative strengthened STEM teaching by offering practical, classroom-focused training. These findings indicate micro-credentials' potential to alleviate the shortage of specialized ECE and SNED training in the Philippines, where professional development remains concentrated in Metro Manila (Abon et al., 2023).

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Adoption in resource-constrained contexts like the Global South, however, is still limited. Varadarajan et al. (2023) note their benefits for learners (flexibility), employers (verifiable skills), and institutions (innovation), but identify barriers such as low institutional capacity and stakeholder awareness. In the Philippines, Parilla et al. (2024) found that educators value micro-credentials for their alignment with CPD requirements and career advancement, yet face affordability and infrastructure constraints. Recent implementations have shown micro-credentials' effectiveness in formally recognizing and validating early childhood professionals' existing competencies, reinforcing their value for career progression (Galindo, 2024). These studies underscore the need for localized evidence on stakeholder preferences and institutional readiness—gaps this study addresses through a mixed-methods feasibility analysis in Northern Mindanao (Abon et al., 2023; Parilla et al., 2024).

Global frameworks and local applications

International frameworks guide micro-credential design by promoting standardization, portability, and lifelong learning alignment. UNESCO (2022) defines micro-credentials as learner-centered, verifiable qualifications that enhance employability and flexible learning. Kato and Weko's (2023) OECD analysis stresses the importance of quality assurance, stakeholder engagement, and alignment with national qualification frameworks, citing Australia and Canada as models integrating practical training and digital delivery—relevant for resource-constrained contexts like the Philippines. Likewise, Ashizawa et al. (2024) highlight tensions between global standardization and local adaptation, emphasizing stakeholder-driven design involving educators, employers, and policymakers—an approach central to this study.

In the Philippines, CHED (2017) mandates competency-based teacher education aligned with these global trends. Yet local studies reveal implementation gaps. Abon et al. (2023) report limited training and technology access among early childhood educators adopting hybrid modes, while Ang et al. (2021) underscore the need for inclusive education training similar to Singapore's model. Analyses of early childhood systems in other Asian contexts reveal persistent challenges in quality, access, and policy implementation, paralleling issues in the Philippines and informing localized adaptations (Qi & Melhuish, 2016). In line with Republic Act 7277 (Magna Carta for Persons with Disabilities), micro-credentials can bridge regional training gaps through accessible, practice-oriented programs, provided they are co-designed with stakeholders to ensure local relevance (Aquino et al., 2019; Bartolome et al., 2025).

Novelty and contribution

While global research on micro-credentials is growing, few studies focus on their feasibility in the Global South, particularly in teacher education. Foundational efforts to restructure teacher education for greater inclusivity have long emphasized systemic institutional change and curriculum reform, providing a historical backdrop for contemporary micro-credential initiatives in special needs education (Booth et al., 2003). Ahsan et al. (2023) and Varadarajan et al. (2023) provide comprehensive reviews but lack specificity on ECE and SNED in resource-constrained settings. Similarly, Kato and Weko (2023) offer policy insights but do not address Southeast Asian contexts like the Philippines, where regional disparities in training access are pronounced (Abon et al., 2023). This study fills these gaps by: (1) providing empirical evidence on stakeholder demand for ECE and SNED micro-credentials in Northern Mindanao, (2) benchmarking best practices from leading Philippine universities, and (3) proposing a stakeholder-driven framework adaptable to other Global South institutions. By integrating practical competencies (e.g., IEP design, play-based

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learning) with flexible delivery modes, the study aligns with CHED's (2017) standards and UNESCO's (2022) vision for lifelong learning, contributing to both local and global discourses on inclusive teacher education.

Synthesis and implications

The literature underscores micro-credentials' potential to address teacher training gaps, particularly in specialized fields like ECE and SNED. Global frameworks emphasize flexibility, quality assurance, and stakeholder engagement (UNESCO, 2022; Kato & Weko, 2023), while local studies highlight the need for accessible, practical programs in the Philippines (Abon et al., 2023; Parilla et al., 2024). This study's stakeholder-driven framework bridges these perspectives, ensuring that the proposed programs are both globally informed and locally relevant. By addressing empirical gaps through mixed-methods data and theoretical gaps through a localized framework, the study positions Xavier University as a leader in innovative teacher education, contributing to national priorities (CHED, 2017) and global goals for inclusive education (Rad, 2022; UNESCO, 2022).

METHOD

This section outlines the research design, participants, data collection methods, instruments, procedures, and analytical approaches used to assess the feasibility of launching 21-unit Early Childhood Education (ECE) and 24-unit Special Needs Education (SNED) certificate programs at Xavier University–Ateneo de Cagayan's School of Education (XU-SOE). Conducted from January to July 2025, the study employs a mixed-methods approach to ensure methodological rigor through the triangulation of quantitative and qualitative data, addressing stakeholder needs, best practices, institutional capacity, and financial viability. The methodology aligns with the study's objectives to fill contextual gaps in Northern Mindanao's teacher training landscape and empirical gaps in localized micro-credential data, while integrating internationally recognized frameworks for flexible learning and credential recognition (UNESCO, 2025; Kato & Weko, 2023; Parilla et al., 2024).

Research design

The study adopted a mixed-methods feasibility design, integrating quantitative data from a needs assessment survey, qualitative data from key informant interviews (KIIs), and comparative analysis from benchmarking to evaluate the viability of the proposed ECE and SNED programs. The quantitative component captured stakeholder demand and preferences, while the qualitative component explored in-depth perspectives on curriculum, delivery, and implementation challenges. Benchmarking provided external standards to inform program design. This design ensured a comprehensive assessment of demand, institutional capacity, and financial sustainability, aligning with CHED standards (CHED, 2017) and global micro-credential trends (Varadarajan et al., 2023). The mixed-methods approach facilitated triangulation, enhancing validity and addressing methodological gaps in teacher education research (Abon et al., 2023; Parilla et al., 2024).

Participants

The study engaged three participant groups to capture diverse perspectives. The needs assessment survey involved 60 purposively selected respondents: 48.33% XU alumni, 15% employees, 23.33% non-XU respondents outside Cagayan de Oro, 5% within the city, and 8.33% community educators. The sample represented in-service teachers (73.33%), preservice educators (23.33%), and other stakeholders, reflecting Region X's educational context (Parilla et al., 2024; Abon et al., 2023). The key informant interviews (KIIs) included

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ten purposively chosen participants—five professionals or graduates with ECE/SNED experience and five graduating education students—selected for their expertise and familiarity with teacher training needs (Ang et al., 2021; Bartolome et al., 2025). Benchmarking covered five leading universities—PNU, UP, Ateneo de Manila, DLSU, and CNU—recognized for their accredited ECE/SNED programs (CHED, 2017; Kato & Weko, 2023). This sampling ensured stakeholder-informed, contextually relevant data for program design and benchmarking.

Data collection procedures

Three data collection methods ensured rigor and alignment with international standards (UNESCO, 2025; Kato & Weko, 2023). A needs assessment survey (via Google Forms, Jan–Jul 2025) gathered quantitative and open-ended responses from 60 stakeholders on demographics, ECE/SNED familiarity, program interest, delivery mode, fees, and certification preferences, following stakeholder-driven feasibility models emphasizing employability and flexible credentialing (Maina et al., 2022; Parilla et al., 2024). Key informant interviews (KIIs) with ten participants (five professionals, five students) were conducted via Zoom to explore curriculum priorities, delivery, faculty capacity, and partnerships; each 45–60-minute session was recorded, transcribed, and participant-verified (Ang et al., 2021; Abon et al., 2023). Benchmarking analyzed program structures, delivery, costs, and certification from PNU, UP, Ateneo, DLSU, and CNU, cross-verifying CHED documents for accuracy (CHED, 2017; Kato & Weko, 2023).

Instruments

Three validated instruments were employed, each aligned with CHED standards and stakeholder-driven research to ensure methodological rigor (Parilla et al., 2024; CHED, 2017). The needs assessment survey questionnaire consisted of 30 items covering demographics, familiarity with ECE/SNED, program interest, delivery preferences, fee acceptability, and certification needs. It included Likert-scale and open-ended questions, validated by three education experts for content clarity, and showed high reliability (Cronbach's $\alpha = 0.9$) (Abon et al., 2023; Aquino et al., 2019). The KII guide, comprising 10 open-ended questions, explored curriculum priorities, delivery modes, capacity challenges, and implementation strategies. It was pilot-tested with two educators to ensure clarity and relevance (Ang et al., 2021; Bartolome et al., 2025). The benchmarking matrix compared five universities (PNU, UP, Ateneo de Manila, DLSU, and CNU) across program duration, delivery modes, costs, and certification features, using prospectuses and CHED documents for accuracy (CHED, 2017).

Data analysis

Data were analyzed using complementary quantitative and qualitative approaches to ensure rigor and alignment with research objectives (Abon et al., 2023; Parilla et al., 2024). Survey data were processed in Excel using descriptive statistics (frequencies, percentages, means) to summarize demographics, program interest, delivery preferences, and fee acceptability. Open-ended responses were thematically coded to reveal insights on the demand for flexible, practice-oriented teacher training (Maina et al., 2022; Varadarajan et al., 2023). KII transcripts were analyzed in NVivo following Braun and Clarke's (2006) six-step thematic analysis—familiarization, coding, theme generation, review, definition, and reporting. Key themes included curriculum priorities (e.g., IEP design), delivery modes, and capacity constraints, echoing prior studies on reflective and inclusive early education (Ang et al., 2021; Bartolome et al., 2025). Benchmarking data underwent qualitative comparative analysis, generating a matrix of best practices such as practicum integration, competency alignment, and ICT-enabled instruction (Philippine Normal University, n.d.; Ateneo de

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Manila University, n.d.; De La Salle University, n.d.; Cebu Normal University, n.d.). A final gap analysis assessed XU-SOE's resources—five ECE/SNED faculty, six additional SOE faculty, and digital platforms (Canvas, MS Teams)—against CHED standards to identify strengths and gaps in specialized instruction (CHED, 2017; Kato & Weko, 2023).

Statistical treatments

Quantitative data were analyzed in Excel using descriptive statistics—frequencies, percentages, and means—to summarize respondent demographics, program interest, and delivery preferences. Reliability testing in SPSS yielded a Cronbach's Alpha of 0.90, confirming strong internal consistency (Abon et al., 2023). Qualitative KII data were thematically analyzed in NVivo, highlighting stakeholder priorities such as play-based learning and hybrid delivery, as well as challenges including faculty workload, consistent with recent studies on inclusive and early education (Ang et al., 2021; Bartolome et al., 2025). Benchmarking results were synthesized into a comparative matrix analyzing program units, costs, and modalities (e.g., DLSU's online delivery model) to identify best practices among leading Philippine universities. A gap analysis then evaluated XU-SOE's resources—five ECE/SNED faculty, six supporting faculty, and digital platforms such as Canvas and MS Teams—against CHED standards to determine institutional strengths (e.g., faculty qualifications) and limitations (e.g., limited SNED practicum supervision). These complementary analyses addressed both empirical and methodological gaps, aligning with international frameworks on micro-credentialing and flexible learning (Parilla et al., 2024; UNESCO, 2025; Kato & Weko, 2023).

Validation

Instrument validity and reliability were rigorously established to ensure methodological credibility. The needs assessment survey was pilot-tested in December 2024 with 10 educators (five XU faculty and five local teachers), yielding a Cronbach's Alpha of 0.9, indicating high internal consistency (Abon et al., 2023). Content validity, confirmed by two ECE/SNED experts, produced strong indices (I-CVI = 0.9, S-CVI/Ave = 0.92, S-CVI/UA = 1.0), demonstrating full expert agreement. Revisions based on pilot feedback ensured alignment with CHED standards (CHED, 2017) and MATATAG curriculum goals. KII data were validated through inter-rater coding (90% agreement) and member checking, ensuring qualitative reliability and representational accuracy (Ang et al., 2021; Bartolome et al., 2025). Benchmarking data from five universities (PNU, UP, Ateneo de Manila, DLSU, CNU) were triangulated across prospectuses and CHED documents for consistency. Finally, XU-SOE's resource gap analysis was verified against CHED standards to confirm institutional compliance. These procedures ensured robust, replicable findings aligned with international research and micro-credentialing standards (Parilla et al., 2024; Maina et al., 2022; Kato & Weko, 2023).

Ethical considerations

The study complied with Xavier University's ethical research protocols and the Philippine Data Privacy Act of 2012 (Republic Act No. 10173). Informed consent outlined the study's purpose, voluntary participation, confidentiality, and participants' right to withdraw. Survey participants provided digital consent via Google Forms, ensuring anonymity through coded identifiers, while key informant interviewees gave verbal and written consent via MS Teams, reviewed recording procedures, and validated transcripts through member-checking. Benchmarking data from Philippine Normal University, University of the Philippines, Ateneo de Manila University, De La Salle University, and Cebu Normal University were obtained from public CHED documents, with institutional permission sought as needed. Faculty and infrastructure data (five ECE/SNED faculty; Canvas and MS

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Teams) were accessed from XU-SOE records with administrative clearance. All digital files were stored on encrypted, password-protected servers accessible only to the research team. These procedures upheld participant protection, data integrity, and compliance with national and global research ethics standards (UNESCO, 2022; Kato & Weko, 2023).

RESULTS AND DISCUSSION

Needs analysis

The needs analysis examined stakeholder demand for Xavier University's proposed 21-unit Early Childhood Education (ECE) and 24-unit Special Needs Education (SNED) certificate programs. Conducted from January to July 2025, it combined a survey of 60 respondents via Google Forms and key informant interviews with 10 participants (five education professionals or graduates and five graduating students). The survey gathered data on demographics, familiarity, program interest, and preferences for delivery mode, schedule, credentialing, fees, and time commitment. Addressing empirical gaps, the analysis provides stakeholder-driven evidence on micro-credential demand in Northern Mindanao, aligning with CHED's teacher education standards (CHED, 2017) and global frameworks for flexible, stackable learning (UNESCO, 2022; Kato & Weko, 2023). Synthesizing survey and interview findings, it informs program design, feasibility, and stakeholder engagement.

Summary of stakeholder needs survey

The survey targeted a diverse stakeholder group, with responses analyzed using descriptive statistics (frequencies, percentages, means) in Excel and thematic coding for open-ended questions in NVivo. Table 1 presents the demographic profile: 48.33% (n=29) were XU alumni, 15% (n=9) XU employees, 23.33% (n=14) non-XU respondents from outside Cagayan de Oro, 5% (n=3) non-XU residents of Cagayan de Oro, and 8.33% (n=5) others (e.g., community educators). Professionally, 73.33% (n=44) were in education/teaching, 5% (n=3) in social sciences/humanities, 5% (n=3) in government/NGO work, 3.33% (n=2) parents/caregivers, and 13.33% (n=8) in other fields (e.g., business, nursing, IT). Geographically, 45% (n=27) were from Cagayan de Oro, 13.33% (n=8) from Misamis Oriental (outside CDO), 8.33% (n=5) from Northern Mindanao, 5% (n=3) from other Philippine regions, 11.67% (n=7) from abroad, and 16.67% (n=10) others.

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Table 1. Demographic characteristics of respondents

Variable	Category	n	%
Affiliation			
	XU Alumnus/Alumna	29	48.33
	Xavier University Employee	9	15.00
	Non-XU (Outside CDO)	14	23.33
	Non-XU (Resident of CDO)	3	5.00
	Other	5	8.33
Current Profession/Field			
	Education/Teaching	44	73.33
	Social Sciences/Humanities	3	5.00
	Government/NGO Work	3	5.00
	Parent/Caregiver	2	3.33
	Other (e.g., Business, Nursing, IT)	8	13.33
Location			
	Cagayan de Oro City	27	45.00
	Misamis Oriental (outside CDO)	8	13.33
	Northern Mindanao (Region X)	5	8.33
	Outside Northern Mindanao	3	5.00
	Outside the Philippines	7	11.67
	Other	10	16.67

Note: N = 60. Percentages are rounded to two decimal places. CDO = Cagayan de Oro

Program interest and familiarity

Table 2 shows familiarity with ECE/SNED: 50% (n=30) had informal knowledge, 15% (n=9) formal training, 15% (n=9) worked in the field, 13.33% (n=8) had limited knowledge, and 1.67% (n=1) were not familiar. Table 3 indicates program interest: 38.33% (n=23) preferred both ECE and SNED, 31.67% (n=19) SNED only, and 30% (n=18) ECE only. Table 4 confirms high enrollment willingness, with 90% (n=54) indicating "Yes" and 10% (n=6) "Maybe." Qualitative responses highlighted motivations like career advancement, CPD compliance, and community service, particularly for inclusive education (Abon et al., 2023).

Table 2. Familiarity with Early Childhood Education (ECE) and Special Needs Education (SNED)

Familiarity Level	n	%
Informal knowledge (e.g., experience/reading)	30	50.00
Formal training or coursework	9	15.00
Already working in the field	9	15.00
Heard of it but know little	8	13.33
Not familiar at all	1	1.67

Note: N = 60. Percentages are rounded to two decimal places

Table 3. Interest in certificate programs

Program Interest	n	%
Both SNED and ECE	23	38.33
Certificate in Special Needs Education	19	31.67
Certificate in Early Childhood Education	18	30.00

Note: N = 60. Percentages are rounded to two decimal places. SNED = Special Needs Education; ECE = Early Childhood Education

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Table 4. Willingness to enroll

Willingness	n	%
Yes	54	90.00
Maybe	6	10.00
No	0	0.00

Note: N = 60. Percentages are rounded to two decimal places.

Delivery and scheduling preferences

Table 5 reveals delivery preferences: 55% (n=33) favored fully online modular/asynchronous learning, 36.67% (n=22) hybrid, 3.33% (n=2) face-to-face, and 5% (n=3) others. Table 6 shows scheduling preferences: 61.67% (n=37) preferred modular/self-paced, 58.33% (n=35) Saturdays, 38.33% (n=23) weekday evenings, and 3.33% (n=2) others. Table 7 indicates time commitment: 61.67% (n=37) preferred 1–3 hours weekly, 25% (n=15) 4–6 hours, 5% (n=3) 7–9 hours, and 8.33% (n=5) 10+ hours.

Table 5. Preferred mode of delivery note: N = 60. Percentages are rounded to two decimal places.

Delivery Mode	n	%
Fully Online (Modular/Asynchronous)	33	55.00
Hybrid (Online and Limited In-Person)	22	36.67
Fully Face-to-Face	2	3.33
Other	3	5.00

Note: N = 60. Percentages are rounded to two decimal places.

Table 6. Preferred Schedule

Schedule Option	n	%
Modular/Self-paced	37	61.67
Saturdays	35	58.33
Weekday evenings (after 5 PM)	23	38.33
Other	2	3.33

Note: N = 60. Respondents could select multiple options, so percentages may sum to more than 100. Percentages are rounded to two decimal places

Table 7. Weekly time commitment

Hours per Week	n	%
1–3 hours	37	61.67
4–6 hours	15	25.00
7–9 hours	3	5.00
10+ hours	5	8.33

Note: N = 60. Percentages are rounded to two decimal places.

Credentialing and fee preferences

Table 8 shows 65% (n=39) preferred both a certificate and Master's credits, 15% (n=9) a non-degree certificate, 15% (n=9) Master's credits only, and 5% (n=3) others. Table 9 indicates fee acceptability: 55% (n=33) supported ₱20,000–₱24,999, 23.33% (n=14) ₱25,000–₱29,999, and 21.67% (n=13) were unsure. Open-ended responses emphasized flexible, practical content (e.g., play-based learning, IEP design) and affordability (Parilla et al., 2024).

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Table 8. Desired credentials

Credential Type	n	%
Both (Certificate and Master's Credits)	39	65.00
Certificate of Completion (non-degree)	9	15.00
Units creditable toward a Master's degree	9	15.00
Other	3	5.00

Note: N = 60. Percentages are rounded to two decimal places.

Table 9. Reasonable fee range for a 21- or 24-Unit Certificate Program

Fee Range (₱)	n	%
20,000–24,999	33	55.00
25,000–29,999	14	23.33
I'm not sure	13	21.67

Note: N = 60. Percentages are rounded to two decimal places. ₱ = Philippine Peso.

Demand indicators

Survey findings indicate strong demand for the proposed ECE and SNED certificate programs, addressing contextual gaps in Northern Mindanao's teacher training landscape (Abon et al., 2023). A high willingness to enroll (90%, n = 54) and balanced interest across ECE (30%), SNED (31.67%), and both fields (38.33%) reflect stakeholder recognition of their professional relevance. Respondents identified key skill gaps—limited training in play-based learning and child development for ECE, and inadequate preparation in differentiated instruction and IEP design for SNED. Most participants, mainly in-service teachers (73.33%, n = 44), emphasized the need for CHED- and CPD-accredited credentials to meet national qualification standards (CHED, 2017). KII insights reinforced the programs' potential to enhance employability in daycare, inclusive, and private education settings, and to strengthen pre-service readiness (Maina et al., 2022; Bartolome et al., 2025). Preferences for online (55%) and hybrid (36.67%) delivery align with global trends in flexible, technology-enabled teacher training (UNESCO, 2022; Ang et al., 2021). The majority favored modular or self-paced formats (61.67%) and light weekly engagement (1–3 hours, 61.67%), highlighting accessibility needs among working educators and professionals. Finally, 65% expressed interest in Master's-level credit recognition, underscoring the programs' perceived academic and career value and addressing empirical gaps in Philippine micro-credential research (Parilla et al., 2024; Kato & Weko, 2023).

Target clientele

The survey and KII findings revealed four primary target groups for the proposed ECE and SNED certificate programs. The largest group comprised in-service teachers (73.33%, n = 44), who sought Continuing Professional Development (CPD) units and specialized competencies in play-based learning for ECE and inclusive instructional strategies for SNED, aligned with CHED professional standards (CHED, 2017; Abon et al., 2023). Stakeholders also expressed interest in innovative developmentally appropriate content beyond core academics, such as early financial literacy integrated into play-based frameworks (Curugan et al., 2020), highlighting the breadth of potential ECE enhancements. Daycare and child development workers, represented among parents and caregivers (3.33%, n = 2) and other professionals (13.33%, n = 8), expressed interest in community-based, practical training to enhance caregiving practices and meet local compliance requirements (Aquino et al., 2019; Bartolome et al., 2025). Fresh graduates and preservice teachers viewed the programs as a

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pathway to specialization and enhanced employability in both private and international education contexts (Varadarajan et al., 2023; Maina et al., 2022). Meanwhile, private school educators and paraprofessionals from social science, government, and NGO sectors (10%) indicated interest in transitioning to teaching and support roles within inclusive and early childhood education settings (UNESCO, 2022). Geographically, respondents were concentrated in Cagayan de Oro (45%) and other areas of Northern Mindanao (8.33%), signifying strong local demand. Notably, international respondents (11.67%) further underscored the potential for scalable online delivery and cross-border engagement.

Synthesis and Implications

The needs analysis confirms strong stakeholder demand for ECE and SNED certificate programs at XU-SOE, driven by professional development needs and regional training gaps. The high enrollment willingness (90%) and preference for flexible delivery (91.67% for online/hybrid) align with global trends in micro-credential implementation, offering a model for accessible teacher training (Ashizawa et al., 2024; Kato & Weko, 2023). The desire for Master's credits (65%) and affordable fees (₱20,000–₱24,999) highlights the programs' potential to enhance employability and meet CPD requirements, addressing national relevance (CHED, 2017). Qualitative feedback from KIIs emphasized practical content (e.g., IEP planning, assistive technology), reinforcing the need for stakeholder-informed curricula. These findings position XU-SOE to address contextual gaps in Northern Mindanao and contribute to global inclusive education goals, filling empirical and methodological gaps through robust stakeholder data (Parilla et al., 2024; Maina et al., 2022).

Benchmarking results

This section presents the benchmarking analysis of certificate programs in Early Childhood Education (ECE) and Special Needs Education (SNED) offered by five leading Philippine universities: Philippine Normal University (PNU), University of the Philippines (UP), Ateneo de Manila University, De La Salle University (DLSU), and Cebu Normal University (CNU). Conducted from January to July 2025, the analysis examined program architecture, curricular content, instructional methodologies, and eligibility criteria, aligning with CHED Memorandum Orders (CMO No. 20, s. 2013; CMO No. 30, s. 2004; CMO No. 74, s. 2017) and international micro-credential frameworks (UNESCO, 2022; Kato & Weko, 2023). The findings identify best practices and lessons for developing 21-unit ECE and 24-unit SNED certificate programs at Xavier University's School of Education (XU-SOE), addressing contextual gaps in Northern Mindanao's teacher training landscape and theoretical gaps in localizing global standards (Ashizawa et al., 2024; Parilla et al., 2024).

List of institutions and programs studied

The benchmarking covered five institutions recognized for their leadership in teacher education and compliance with CHED standards. Philippine Normal University (PNU) offers an 18-unit ECE certificate focusing on foundational theories, child development, and pedagogy, alongside a 21-unit SNED certificate emphasizing inclusive education methodologies (PNU, n.d.). The University of the Philippines (UP) provides a 24-unit ECE certificate with a practicum for experiential learning and a 24-unit SNED certificate integrating diagnostic teaching and intervention strategies (UP, n.d.). Ateneo de Manila University delivers 18-unit certificates in both ECE and SNED, featuring Montessori and Reggio Emilia pedagogical principles in the former and the use of assistive technologies in the latter (Ateneo, n.d.). De La Salle University (DLSU) offers 21-unit programs in ECE and SNED, the former highlighting ICT integration in teaching and the latter addressing autism spectrum disorder (ASD) and ADHD support (DLSU, n.d.). Finally, Cebu Normal University (CNU) provides 18-unit ECE and SNED certificates that emphasize community-based

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approaches, behavioral management, and individualized education program (IEP) development (CNU, n.d.). Data were derived from institutional prospectuses, CHED documentation, and course syllabi to ensure comprehensive and accurate comparison across models (CHED, 2017).

Benchmark comparison table

Table 10 summarizes key metrics across the benchmarked programs, facilitating comparison of duration, units, cost, delivery mode, credentials, and entry requirements.

Table 10. Benchmark comparison summary

Institution	Program	Duration	Units	Cost (₱)	Delivery Mode	Credentials	Entry Requirements
PNU	ECE	18 weeks	18	18,000	Face-to-face	Certificate	Bachelor's degree
PNU	SNED	21 weeks	21	20,000	Face-to-face	Certificate	Bachelor's in education/related field
UP	ECE	2 semesters	24	25,000	Hybrid	Certificate, CPD units	Bachelor's, teaching experience preferred
UP	SNED	2 semesters	24	25,000	Hybrid	Certificate, CPD units	Bachelor's, SNED experience preferred
Ateneo	ECE	18 weeks	18	22,000	Hybrid	Certificate	Bachelor's, statement of purpose
Ateneo	SNED	18 weeks	18	22,000	Hybrid	Certificate	Bachelor's, letter of intent
DLSU	ECE	21 weeks	21	20,000	Online	Certificate, CPD units	Bachelor's, teaching experience
DLSU	SNED	21 weeks	21	20,000	Online	Certificate, CPD units	Bachelor's, SNED experience
CNU	ECE	18 weeks	18	18,000	Face-to-face	Certificate	Bachelor's degree
CNU	SNED	18 weeks	18	18,000	Face-to-face	Certificate	Bachelor's, SNED interest

Note: Costs are approximate, based on prospectuses. CPD = Continuing Professional Development.

Best practices identified

The benchmarking revealed several best practices essential for developing effective ECE and SNED certificate programs. Notably, the modular and CPD-accredited structures adopted by UP and DLSU enhance employability while aligning with CHED's professional development standards (CHED, 2004, 2013, 2017; Parilla et al., 2024). Practicum integration, evident in UP's ECE and CNU's SNED programs, bridges theory and practice, ensuring real-world application of pedagogical principles (Aquino et al., 2019). Innovative pedagogies, such as Ateneo's incorporation of Montessori and Reggio Emilia approaches in ECE and the use of assistive technologies in SNED, reflect global trends in learner-centered education (Ang et al., 2021). Similarly, ICT integration in DLSU's programs strengthens educators' technological competencies consistent with 21st-century teaching practices (Toyongan, 2024). CNU's emphasis on community-based approaches promotes contextual relevance, while PNU and UP's strong focus on inclusive education, particularly in diagnostic teaching and individualized education program (IEP) design, addresses diverse learner needs (UNESCO, 2022). Collectively, these practices fill methodological gaps by modeling effective program structures and bridge theoretical gaps by aligning local implementations with emerging global micro-credentialing standards (Kato & Weko, 2023; Ashizawa et al., 2024).

Proposed eligibility criteria

To ensure program quality and credibility, eligibility requirements were developed based on benchmarked institutions (Parilla et al., 2024). For the ECE Certificate, applicants must

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hold a bachelor's degree in education or a related field, preferably with teaching experience, and submit a statement of purpose expressing interest in early childhood education. For the SNED Certificate, applicants must possess a bachelor's degree in education, psychology, or allied disciplines, with preference for those with experience in special needs education, and submit a letter of intent outlining their professional goals. General admission requirements include the submission of academic transcripts, professional recommendations, and a successful interview with program coordinators, consistent with CHED standards (CHED, 2017). Instructor qualifications emphasize both academic and practical expertise. ECE instructors must hold a master's degree in early childhood education or a related field, have at least three years of teaching experience, and demonstrate training in innovative pedagogies such as Montessori methods. SNED instructors must possess a master's degree in special needs education or psychology, at least three years of experience working with learners with disabilities, and certified training in individualized education program (IEP) design or assistive technologies.

Synthesis and implications

The benchmarking confirms the viability of XU-SOE's proposed ECE and SNED programs, with best practices such as practicum integration, ICT use, and CPD accreditation aligning with stakeholder needs (90% enrollment willingness) and CHED standards. The programs' hybrid delivery and community focus address local needs in Northern Mindanao, while stackable credentials align with national teacher education policies (CHED, 2017) and global micro-credential frameworks (UNESCO, 2022). The findings address empirical gaps through comparative data and methodological gaps through structured benchmarking analysis, positioning XU-SOE as a leader in teacher education innovation (Parilla et al., 2024).

Proposed program design

This section presents the preliminary design for the 21-unit Early Childhood Education (ECE) and 24-unit Special Needs Education (SNED) certificate programs at Xavier University's School of Education (XU-SOE). Informed by the needs assessment survey (90% enrollment willingness, 55% preference for online delivery, 65% interest in Master's credit), benchmarking results (e.g., UP's practicum, DLSU's ICT integration), and key informant interviews (emphasizing practical skills and hybrid delivery), the programs align with CHED standards (CMO No. 20, s. 2013; CMO No. 74, s. 2017) and global micro-credential frameworks (UNESCO, 2022). The design addresses contextual gaps in Northern Mindanao's teacher training landscape and theoretical gaps by localizing global best practices (Parilla et al., 2024; Ashizawa et al., 2024).

Certificate in Early Childhood Education (ECE)

This 21-unit program prepares educators to teach children aged 3–8 through competency-based training aligned with the MATATAG K–12 curriculum. It aims to develop understanding of child development, competence in designing play- and inquiry-based lessons, and proficiency in integrating ICT and innovative pedagogies such as Montessori and Reggio Emilia. Targeting in-service teachers, daycare workers, and preservice educators, the program addresses strong demand for practical and flexible training (Abon et al., 2023). As seen in Table 11, the seven-course curriculum balances theory, practice, and innovation to build both foundational knowledge and applied teaching skills.

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Table 11. Proposed Curriculum for the Certificate in Early Childhood Education (ECE) Program

Course Code	Course Title	Units	Brief Description
ECE 101	Foundations of Early Childhood Education	3	Examines major theories (Piaget, Vygotsky) and their alignment with the MATATAG K–12 curriculum.
ECE 102	Child Development and Psychology	3	Studies developmental milestones and socio-emotional learning essential to early education.
ECE 103	Early Literacy and Numeracy	3	Builds foundational reading and math skills aligned with employability outcomes.
ECE 104	Play-Based and Inquiry-Based Learning	3	Trains educators in interactive, child-centered pedagogies for classroom application.
ECE 105	Montessori and Reggio Emilia Approaches	3	Explores innovative ECE models emphasizing learner autonomy and creativity.
ECE 106	ICT in Early Childhood Education	3	Integrates digital tools and technologies for early learning, addressing modern ECE needs.
ECE 107	Practicum in Early Childhood Education	3	Provides supervised field experience in partner schools focusing on play-based instruction.

Certificate in Special Needs Education (SNED)

The 24-unit Certificate in Special Needs Education (SNED) program equips educators and allied professionals to support learners with diverse disabilities through inclusive and evidence-based practices. Its objectives are to: (1) diagnose and assess special needs, (2) design and implement individualized education programs (IEPs), and (3) apply assistive technologies and behavioral strategies. Emerging artificial intelligence applications further promise to enhance support for special needs and overcome language barriers in inclusive settings, offering future-oriented competencies for program graduates (Fitas, 2025). Innovative data-driven approaches, including machine learning for identifying optimal teaching methods for children with autism spectrum disorder, can further personalize instruction and enhance SNED practicum outcomes (Zoana et al., 2023). Designed for teachers, paraprofessionals, and psychology graduates, the program responds to strong stakeholder demand (31.67% for SNED, 38.33% for both ECE and SNED) and qualitative insights highlighting IEP design as a critical skill (Parilla et al., 2024). The curriculum integrates theory and practice across eight courses, emphasizing hands-on training, inclusive pedagogy, and digital fluency, as shown in Table 12.

Table 12. Proposed curriculum for the Certificate in Special Needs Education (SNED) program

Course Code	Course Title	Units	Description / Focus
SNED 101	Foundations of Special Needs Education	3	Principles, historical perspectives, and legal frameworks (e.g., RA 7277) aligned with PNU's inclusive education model.
SNED 102	Inclusive Education Strategies	3	Differentiated instruction and classroom inclusion strategies addressing survey-identified training needs.
SNED 103	Behavioral Management in SNED	3	Techniques for managing ADHD, ASD, and behavioral challenges based on KII student priorities.
SNED 104	Assistive Technologies in Education	3	Integration of digital tools and assistive technologies (e.g., speech-to-text software), inspired by Ateneo's approach.
SNED 105	IEP Design and Implementation	3	Practical creation, implementation, and evaluation of IEPs, a key priority among professional KIIs.
SNED 106	Autism and Developmental Disabilities	3	Understanding and supporting learners with ASD and other developmental disorders, mirroring DLSU's focus.
SNED 107	Practicum in Special Needs Education	6	Supervised field experience in inclusive and special education settings, adapted from CNU's practicum model.

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Both programs will run for three months (12 weeks) in a hybrid format via Canvas and MS Teams/Zoom, combining asynchronous modules (preferred by 55% of respondents) with live Saturday sessions to accommodate working educators (61.67% preference for flexible schedules). Classes are modular, self-paced, and require 1–3 hours per week, promoting accessibility and balance for in-service teachers. Assessments will include lesson plans, case studies, IEP development projects, and practicum portfolios to ensure competency-based evaluation consistent with CHED (2017) and UNESCO (2022) standards. This flexible structure aligns with survey and KII feedback, addressing identified skill gaps while enhancing professional readiness and employability in Region X's early childhood and special needs education sectors.

Admission requirements and certification

Admission to the ECE program requires a bachelor's degree in education or related fields, while the SNED program accepts applicants from education, psychology, or allied disciplines. Both require a statement of purpose, official transcripts, and an interview, consistent with CHED standards (CHED, 2017). KIIs recommended prioritizing experienced teachers for SNED admission. Graduates will receive a certificate and CPD units, with 65% of survey respondents supporting the inclusion of Master's credits, subject to CHED approval—an enhancement expected to improve employability (Parilla et al., 2024). The program design ensures CHED compliance and alignment with global micro-credential standards, addressing theoretical gaps identified by UNESCO (2022).

Institutional capacity assessment

Xavier University's School of Education demonstrates readiness to deliver the proposed 21-unit Early Childhood Education (ECE) and 24-unit Special Needs Education (SNED) certificate programs through its qualified faculty, existing infrastructure, and administrative systems. Five full-time faculty members hold graduate degrees in ECE or SNED, with expertise in play-based learning, inclusive education, and assistive technologies, complemented by six additional faculty available for curriculum and administrative support. To address potential workload issues identified in key informant interviews (KIIs)—particularly for practicum supervision—the inclusion of adjunct instructors and continuous professional development in digital pedagogy are planned. Physical resources such as technology-equipped classrooms, stable learning management systems (Canvas, MS Teams, Zoom), and institutional IT support ensure hybrid and asynchronous delivery, aligning with both survey preferences for flexible learning and benchmarking insights from leading institutions such as DLSU and UP. The university's robust digital platforms support inclusive delivery, building on growing evidence of digital technologies' role in facilitating educational transitions for students with disabilities (Pacheco, 2023). Administrative oversight, handled by the Dean and coordinated through the Vice President for Higher Education, supports faculty load management, practicum logistics, and CHED compliance, ensuring smooth implementation and accountability.

Financially, the program is sustainable and scalable. The estimated annual operating cost of ₱500,000 covers faculty honoraria, technology infrastructure, and marketing, while projected revenues from 50 enrollees per year at ₱22,500 each yield ₱1.125 million, achieving break-even in the first year. Continued growth is expected through CPD accreditation, stackable Master's credits, and international enrollment via online delivery. Benchmarking with PNU and CNU suggests cost efficiency through school partnerships for practicum placements, while CHED funding opportunities can offset technology and faculty development expenses. These strategies mitigate identified risks such as limited SNED

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faculty and connectivity constraints, ensuring that the programs are pedagogically robust, financially viable, and aligned with national quality assurance standards and global trends in micro-credentialing (CHED, 2017; UNESCO, 2022; Parilla et al., 2024).

Limitations

This study's purposive sample of 60 survey respondents and 10 key informant interviews (KIIs) is suitable for assessing the feasibility of ECE and SNED micro-credential programs at Xavier University's School of Education (XU-SOE) but has limitations in sample size and representativeness. The modest sample size (N=60) limits generalizability to broader populations in Northern Mindanao or the Philippines (Abon et al., 2023). The purposive selection, prioritizing in-service teachers (73.33%) and XU alumni (48.33%), may underrepresent rural educators, non-education professionals (13.33%), and international learners (11.67%) (Table 1). Similarly, the 10 KIIs, while providing rich qualitative insights, focus on education professionals and students, potentially missing perspectives from daycare workers or other stakeholders. Geographic representation is skewed toward Cagayan de Oro (45%), with limited input from other Philippine regions (5%) or rural areas, where internet access constraints, noted in KIIs, may exclude participants (Toyongan, 2024). These limitations suggest caution in scaling findings nationally or globally. Future research should use larger, stratified samples to enhance representativeness and inclusivity, aligning with global micro-credential frameworks (UNESCO, 2022; Kato & Weko, 2023).

CONCLUSION

This feasibility study confirms the viability of implementing micro-credential programs in Early Childhood Education (ECE) and Special Needs Education (SNED) at Xavier University-Ateneo de Cagayan. The research demonstrates robust stakeholder demand, with 90% of surveyed educators expressing willingness to enroll, particularly for programs offering flexible hybrid delivery (55% online preference) and stackable credentials (65% favoring Master's credits). Benchmarking against leading Philippine institutions revealed critical success factors including practicum integration and ICT-enabled instruction, which align with global best practices in competency-based teacher education. While institutional capacity assessments confirm adequate faculty expertise and technological infrastructure, the study identifies key implementation challenges such as limited SNED instructors for practicum supervision and the need for enhanced technical support for remote learners.

Financial analysis indicates strong sustainability potential, with projected first-year revenues of ₱1,125,000 exceeding operational costs by 125%. The programs directly address critical gaps in Northern Mindanao's teacher training landscape while contributing to national CHED priorities and global education agendas (SDG4). Stakeholder insights particularly emphasized the importance of practical skill development, with IEP design and play-based pedagogy emerging as priority competencies. The study makes three significant contributions: (1) empirical evidence for micro-credential adoption in resource-constrained educational contexts, (2) a replicable stakeholder-driven framework for program design in the Global South, and (3) actionable insights for balancing standardization and localization in teacher education reforms.

To ensure the successful implementation of the ECE and SNED micro-credential programs, XU-SOE will integrate stakeholder insights and benchmarking outcomes into four key action areas. Curriculum enhancement will prioritize practical competencies through a 3-unit ECE practicum on play-based learning and a 6-unit SNED practicum focused on IEP

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development. The programs will adopt stackable credential structures aligned with global standards while ensuring CHED compliance for Continuing Professional Development (CPD) accreditation. Delivery and support systems will optimize Canvas for asynchronous instruction and provide offline access for rural participants. Faculty will receive training in ICT tools such as MS Teams and Zoom, supported by a dedicated technical team. Faculty development and partnerships will include recruiting adjunct SNED faculty for practicum supervision, offering training in assistive technologies, and partnering with local schools and NGOs for practicum placements to minimize costs and enhance community engagement. Sustainability measures will involve tiered tuition pricing (₱20,000–24,999) with scholarships for underserved educators, alongside targeted social media campaigns to attract in-service teachers and international learners.

A phased implementation plan is proposed to ensure feasibility and sustainability. By Q4 2025, the program development team will finalize curricula with stakeholder input and secure CHED approval. Partnerships with local schools and marketing initiatives will be established by December 2025. The pilot phase, launching in January 2026 with 25–30 enrollees per track, will incorporate real-time feedback to refine delivery. Full-scale rollout is planned for SY 2026–2027, followed by annual reviews to assess scalability and responsiveness to evolving educational needs. This timeline aligns institutional capacities with stakeholder priorities for flexibility, accessibility, and quality.

AUTHOR CONTRIBUTION

Author: Conceptualization, Methodology, Software, Data curation, Writing—Original draft preparation, Visualization, Investigation, Supervision, Software, Validation, Writing, Reviewing, and Editing.

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