Journal of Education and Teaching (JET)
Vol. 6 No. 3 2025

Pioneering the I-COPE Model: Integrating Outcomes-Based Education, Ignatian Pedagogical Paradigm, and 5Es Inquiry Framework in Pre-Service Teacher Education for Technology Integration

Draft article history
Submitted: 06-21-2025;
Revised: 08-24-2025;
Accepted: 08-28-2025;

Ronald M. Quileste, PhD
School of Education, Xavier University-Ateneo de Cagayan
Corresponding email: rquileste@xu.edu.ph

ABSTRACT: This mixed-methods study evaluated the pioneering I-COPE model, integrating Outcomes-Based Education (OBE), Ignatian Pedagogical Paradigm (IPP), and the 5Es inquiry framework, in ED 11 - Educational Technology 1 at Xavier University – Ateneo de Cagayan, Philippines, during the 2024–2025 academic year. Fifty pre-service teachers participated, with data collected through surveys, pretest/posttest assessments (N = 44), seatwork, and semi-structured interviews (N = 10 per term). A Wilcoxon signed-rank test revealed significant academic improvement ($Z = -3.421$, $p < .001$, $r = -0.621$), driven by OBE's structured outcomes. Midterm surveys indicated moderate engagement (26–28% positive responses, Mdn = 3.70–3.80), while final surveys showed strong feedback (60–70% positive, Mdn = 4.00), reflecting 5Es' inquiry and IPP's reflective practices. Interview themes, including Cognitive Engagement and Holistic Growth, and strong inter-domain correlations (r_s = 0.721–0.945) confirmed I-COPE's synergistic impact. Weak survey-seatwork correlations (r_s = 0.003–0.105) suggest assessment refinements. As the first evaluation of I-COPE in a Philippine Jesuit context, this study aligns with CHED's OBE mandates and PPST's technology competencies, offering a groundbreaking model for teacher education (Barrot, 2020; Lucas, 2020). Recommendations include diversified tasks and clearer 5Es guidance to enhance scalability.

Keywords: I-COPE Model, Pre-Service Teacher Education, Educational Technology, Outcomes-Based Education, Ignatian Pedagogical Paradigm.

ABSTRAK: *Penelitian mixed-methods ini mengevaluasi model I-COPE yang bersifat pionir, dengan mengintegrasikan* Outcomes-Based Education *(OBE),* Ignatian Pedagogical Paradigm *(IPP), dan kerangka inkuiri 5Es dalam mata kuliah ED 11 - Teknologi Pendidikan 1 di Universitas Xavier – Ateneo de Cagayan, Filipina, pada tahun akademik 2024–2025. Sebanyak lima puluh mahasiswa calon guru berpartisipasi, dengan data dikumpulkan melalui survei, pretest/posttest (N = 44), tugas kelas, dan wawancara semi-terstruktur (N = 10 per semester). Uji Wilcoxon signed-rank menunjukkan peningkatan akademik yang signifikan (Z = -3.421, p < .001, r = -0.621), yang didorong oleh struktur capaian OBE. Survei tengah semester menunjukkan keterlibatan moderat (26–28% respons positif, Mdn = 3,70–3,80), sedangkan survei akhir menunjukkan umpan balik yang kuat (60–70% respons positif, Mdn = 4,00), yang mencerminkan inkuiri 5Es dan praktik reflektif IPP. Tema wawancara, termasuk Keterlibatan Kognitif dan Pertumbuhan Holistik, serta korelasi antar-domain yang kuat (r_s = 0.721–0.945) menegaskan dampak sinergis I-COPE. Korelasi lemah antara survei dan tugas kelas (r_s = 0.003–0.105) mengindikasikan perlunya penyempurnaan asesmen. Sebagai evaluasi pertama terhadap I-COPE dalam konteks Jesuit di Filipina, penelitian ini selaras dengan mandat OBE dari CHED dan kompetensi teknologi PPST, serta menawarkan model terobosan bagi pendidikan calon guru (Barrot, 2020; Lucas, 2020). Rekomendasi mencakup diversifikasi tugas dan panduan 5Es yang lebih jelas untuk meningkatkan skalabilitas.*

Kata Kunci: *Model I-COPE,* Ignatian Pedagogical Paradigm*, Pendidikan Calon Guru,* Outcomes-Based Education*, Teknologi Pendidikan.*

INTRODUCTION

Teacher education worldwide is under increasing pressure to prepare graduates for 21st-century classrooms, where technology integration is no longer optional but foundational. In the Philippines, national policies such as the Commission on Higher Education's (CHED) Outcomes-Based Education (OBE) mandate and the Philippine Professional Standards for Teachers (PPST) emphasize technology-enhanced competencies. Jesuit institutions, meanwhile, advance the Ignatian Pedagogical Paradigm (IPP), which foregrounds holistic development through reflection and values formation (CHED, 2017; PPST, 2017; Lucas, 2020). Together, these frameworks underscore the need for teacher preparation models that are both competency-driven and values-oriented. CHED's Outcomes-Based Education (OBE) mandates clear student learning outcomes (SLOs), such as designing digital lesson plans, to ensure competency-driven training. PPST emphasizes technology-enhanced teaching to foster critical thinking and innovation. IPP, rooted in Jesuit values, promotes holistic development through reflective practices like cura personalis (care for the whole person). Despite these frameworks, Philippine teacher education faces challenges, including limited access to digital tools, inconsistent training quality, and fragmented pedagogical approaches, particularly in resource-constrained settings (DepEd, 2019; Tondeur et al., 2017).

Despite policy reforms and numerous studies on OBE, inquiry-based learning, and reflective pedagogies, no integrated model has been systematically tested that brings these approaches together in teacher education. OBE offers measurable competencies but often lacks emphasis on inquiry and reflection. Similarly, IPP cultivates holistic development and ethical awareness, yet does not always align with concrete outcome frameworks. The 5Es inquiry model promotes active engagement but may be implemented without sustained reflection or clear outcome mapping. As a result, teacher education programs risk remaining fragmented, with students acquiring technical skills in isolation from critical inquiry and ethical formation. This study responds to that gap by introducing and evaluating the I-COPE model, which uniquely combines OBE, IPP, and the 5Es inquiry framework. By empirically testing I-COPE in a Philippine Jesuit university context, the research addresses a critical need for integrated, evidence-based frameworks that prepare pre-service teachers for technology-rich, values-driven classrooms. Implemented in ED 11 - Educational Technology 1 at Xavier University – Ateneo de Cagayan during the 2024–2025 academic year, I-COPE fosters technical skills, critical thinking, and ethical reflection, aligning with CHED, PPST, and Jesuit objectives (Barrot, 2021; Bybee, 2019). This integrated approach offers a novel solution to enhance teacher education in the Philippine context.

I-COPE is grounded in constructivism, Ignatian pedagogy, and OBE. Constructivism supports the 5Es framework (Engage, Explore, Explain, Elaborate, Evaluate), encouraging active learning through hands-on activities like exploring authoring tools (Bybee, 2019). IPP's reflective cycle—context, experience,

Corresponding email: rquileste@xu.edu.ph

reflection, action, evaluation—promotes ethical and personal insights via journaling (Lucas, 2020). OBE ensures measurable SLOs, aligning instruction and assessments with competencies like digital lesson design (Barrot, 2021). Together, these frameworks create a cohesive learning environment that addresses the limitations of fragmented models. The I-COPE model structures learning through six modules, each integrating OBE's SLOs, 5Es' inquiry stages, and IPP's reflective practices. For instance, in Module 4, students engage with real-world technology challenges, explore tools like Canva, explain their findings, elaborate through collaborative projects, and evaluate their work against SLOs, while reflecting on technology's ethical implications. This design fosters technical proficiency, critical thinking, and values-driven teaching, overcoming the shortcomings of traditional approaches (Koh & Tan, 2022). By connecting technical skills with reflective and outcome-driven practices, I-COPE prepares teachers for diverse, technology-rich classrooms.

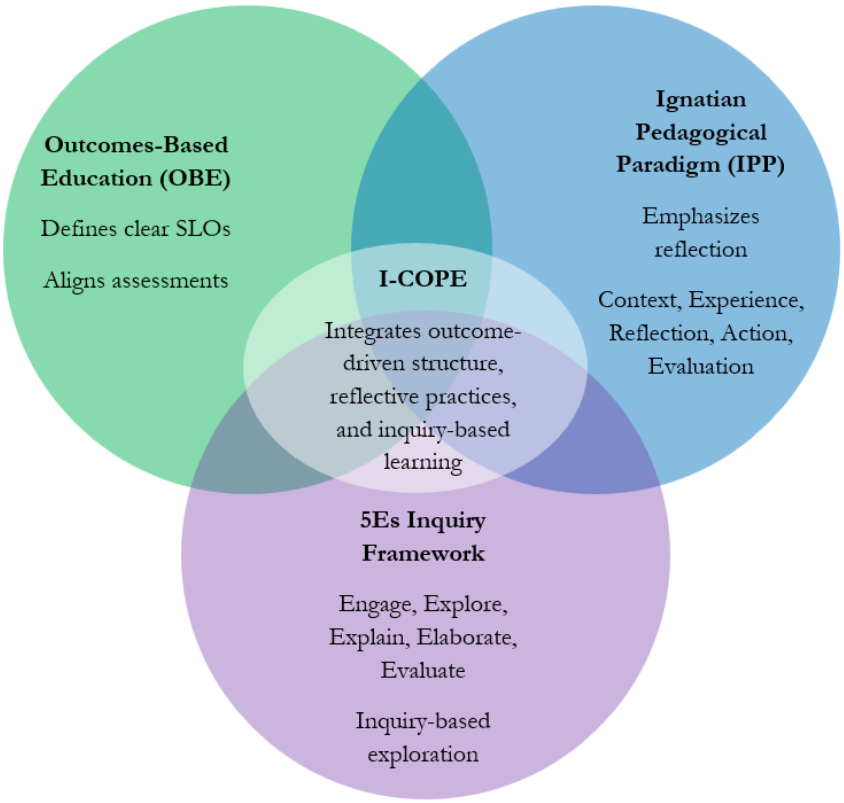

Figure 1. The I-COPE Conceptual Framework illustrating the integration of Outcomes-Based Education, Ignatian Pedagogical Paradigm, and 5Es inquiry framework in pre-service teacher education.

This study, the first to evaluate I-COPE in a Philippine Jesuit context, employs a mixed-methods approach with 50 pre-service teachers to assess its impact on academic performance, engagement, feedback, and component synergy. It addresses four research questions: 1) How does I-COPE enhance technology integration skills? 2) How does it influence cognitive, behavioral,

Corresponding email: rquileste@xu.edu.ph

emotional, and spiritual engagement? 3) How do students perceive its effectiveness? 4) How do OBE, IPP, and 5Es interact to support learning?

I-COPE's integrated design offers a potentially scalable model for resource-constrained settings, contributing to global teacher education discourse (Koh & Tan, 2022).

RESEARCH METHOD

Research Design

This study employed a convergent mixed-methods design to evaluate the I-COPE model, integrating Outcomes-Based Education (OBE), Ignatian Pedagogical Paradigm (IPP), and the 5Es inquiry framework, in ED 11 - Educational Technology 1 at Xavier University – Ateneo de Cagayan, Philippines, during the 2024–2025 academic year. The convergent design was chosen to collect quantitative (surveys, pretest/posttest, seatwork scores) and qualitative (semi-structured interviews) data simultaneously, enabling a comprehensive assessment of I-COPE's impact on academic performance, engagement, feedback, and component synergy (Creswell & Plano Clark, 2018). Unlike explanatory designs, which use qualitative data to explain quantitative results sequentially, or exploratory designs, which develop instruments from qualitative findings, the convergent approach facilitated triangulation by cross-verifying quantitative outcomes (e.g., test scores) with qualitative insights (e.g., interview themes) within the same timeframe (Guetterman & Fetters, 2020). This design was optimal for addressing the study's four research questions in a Philippine Jesuit context, ensuring robust findings through integrated data analysis. The study was approved by Xavier University's Institutional Review Board (IRB) in August 2024, ensuring ethical conduct.

Participants

The study purposively sampled 50 pre-service teachers (participant IDs 1–50) from 52 enrolled in ED 11, a mandatory course for second-year Bachelor of Secondary Education students. Two students were excluded due to incomplete survey responses, resulting in N = 50 for surveys and seatwork, and N = 44 for pretest/posttest (six incomplete submissions). Participants, aged 18–22, had a gender distribution of 58% female and 42% male. Their first-year GPA averaged 2.75 (B, Philippine grading scale), reflecting moderate academic proficiency. Digital literacy, assessed via a pre-course self-report, showed 60% with basic skills (e.g., Google Suite), 30% with intermediate skills (e.g., Canva, basic coding), and 10% with advanced skills (e.g., authoring tools). For qualitative data, 20 participants (10 per term, labeled P1–P10) were randomly selected for interviews to ensure diverse perspectives. All provided written informed consent, ensuring voluntary participation and data anonymity. Purposive sampling aligned with the study's focus on I-COPE's impact in a Jesuit context (Creswell & Plano Clark, 2018).

Instruments

Four validated instruments, aligned with I-COPE's components (OBE, IPP, 5Es) and research questions, were developed to collect comprehensive data:

Corresponding email: rquileste@xu.edu.ph

Journal of Education and Teaching (JET) Volume 6 No. 3, 2025
DOI: 10.51454/jet.v6i3.687

- I-COPE Engagement and Feedback Scale: A 20-item, 5-point Likert-scale survey (1 = Strongly Disagree, 5 = Strongly Agree) assessed engagement (midterm, RQ2) and feedback (final, RQ3) across four domains: Cognitive/OBE, Behavioral/IPP, Emotional/5Es, and Spiritual/Integration. Sample items included: Cognitive/OBE ("I clearly understood the course's learning outcomes"), Behavioral/IPP ("Reflective journaling helped me connect technology to my teaching"), Emotional/5Es ("Exploring digital tools was engaging and motivating"), and Spiritual/Integration ("I-COPE activities aligned with my values as a future teacher"). Pilot-tested in 2023 with 30 pre-service teachers (Cronbach's α = 0.85–0.90), the survey was re-evaluated in December 2024 to ensure applicability for the 2024–2025 academic year, confirming reliability (Cronbach's α = 0.87–0.91, N = 50) and content validity through expert review (90% agreement).
- Seatwork and Participation Scores: Six modules (Modules 1–3 midterm, Modules 4–6 final) included tasks such as creating digital lesson plans, exploring authoring tools, and reflective journaling, scored out of 30 points per term (N = 50). Rubrics, designed to reflect OBE's SLOs, 5Es' inquiry stages, and IPP's reflective practices, were validated by two education experts (90% inter-rater agreement) and re-assessed in 2024 to align with updated course SLOs.
- Pretest/Posttest Assessments: A 60-item multiple-choice test measured technology integration skills (e.g., using Canva, Google Classroom). Administered pre- and post-intervention (N = 44), it was pilot-tested in 2023 (Cronbach's α = 0.88) and re-validated in December 2024 for content alignment with CHED's OBE standards (Cronbach's α = 0.89).
- Semi-Structured Interviews: 20–30-minute Zoom interviews (N = 10 per term, 20 total) explored participants' experiences with I-COPE. Sample questions included: "How did the I-COPE model influence your engagement with technology integration?" and "Which aspects of I-COPE (e.g., inquiry activities, reflections) most supported your learning?" The protocol, pilot-tested in 2023, was reviewed in December 2024 to ensure clarity and relevance, with minor adjustments to reflect updated module content.

All instruments underwent re-evaluation in December 2024 to confirm reliability and validity for the 2024–2025 context, addressing potential shifts in course content, student demographics, or technological tools. This process involved expert reviews, statistical re-analysis, and alignment with CHED and PPST standards, ensuring robust data collection.

Data Collection Procedures

Data collection occurred from January to May 2025, as shown in Table 1:

- Week 1 (January 2025): Administered pretest (N = 44) in a proctored classroom to establish baseline technology skills.

Corresponding email: rquileste@xu.edu.ph

- Weeks 2–7: Delivered Modules 1–3, including OBE-aligned tasks (e.g., SLO-based lesson plans), 5Es inquiry activities (e.g., exploring authoring tools), and IPP journaling. Instructors provided weekly feedback.
- Weeks 8–9: Collected midterm data: surveys (N = 50, Google Forms), seatwork scores (N = 50), and interviews (N = 10, Zoom). Interviews were recorded, transcribed, and verified by participants.
- Weeks 10–15: Implemented Modules 4–6, refining tasks based on midterm feedback (e.g., extended 5Es exploration time).
- Weeks 16–17 (May 2025): Administered posttest (N = 44), final surveys (N = 50), seatwork scores (N = 50), and interviews (N = 10), following identical protocols.

Electronic tools (Google Forms, Zoom) ensured accessibility, with paper-based options for connectivity issues. Seatwork was graded by two raters (90% inter-rater reliability). Interview recordings were encrypted, transcribed, and deleted post-transcription in May 2025.

Table 1. Data Collection Timeline (January–May 2025)

Weeks	Activity	Details
Week 1	Pretest	N = 44, proctored classroom, baseline skills
Weeks 2–7	Modules 1–3	OBE tasks, 5Es activities, IPP journaling
Weeks 8–9	Midterm Data	Surveys (N = 50), seatwork (N = 50), interviews (N = 10)
Weeks 10–15	Modules 4–6	Refined tasks based on midterm feedback
Weeks 16–17	Final Data	Posttest (N = 44), surveys (N = 50), seatwork (N = 50), interviews (N = 10)

Data Analysis

Quantitative data were analyzed using jamovi 2.3:

- RQ1 (Academic Performance): Wilcoxon signed-rank test compared pretest/posttest scores (N = 44), with effect size (r) for non-normal data (Shapiro-Wilk, $p < .05$).
- RQ2 (Engagement): Descriptive statistics (medians, IQR, % positive) and Spearman's correlations analyzed midterm survey and seatwork data (N = 50).
- RQ3 (Feedback): Descriptive statistics and Spearman's correlations for final survey and seatwork data (N = 50).
- RQ4 (Component Interaction): Spearman's correlations and thematic analysis of interviews assessed OBE, IPP, and 5Es synergy.

Qualitative data were analyzed using NVivo 14, following Braun and Clarke's (2019) thematic analysis (90% inter-rater agreement). Results were integrated via joint displays for triangulation (Guetterman & Fetters, 2020).

Corresponding email: rquileste@xu.edu.ph

Ethical Considerations

The study adhered to rigorous ethical protocols approved by Xavier University's IREB (August 2024). Participants provided written informed consent, detailing their right to withdraw without academic or personal consequences. Anonymity was ensured through participant IDs (1–50 for quantitative data, P1–P10 for interviews), with no identifiable information collected. Quantitative data were stored on a password-protected server, accessible only to the research team, using encrypted cloud storage compliant with Philippine Data Privacy Act of 2012. Interview recordings were encrypted, stored on a secure university server, transcribed verbatim, and permanently deleted in May 2025 after transcription. Transcripts underwent member checking, allowing participants to review and verify content for accuracy. To mitigate potential coercion, recruitment was conducted by a neutral third party, and participation was explicitly voluntary, with no impact on course grades. The study complied with Jesuit ethical standards, emphasizing respect for participants' dignity, autonomy, and cultural context. No risks or conflicts of interest were identified, and data handling followed international ethical guidelines for educational research (Creswell & Plano Clark, 2018; Merriam & Grenier, 2019). Regular IRB audits ensured ongoing compliance, and participants received a summary of findings to acknowledge their contribution, fostering transparency and trust.

RESULT AND DISCUSSION

This section presents the mixed-methods evaluation of the I-COPE model, integrating Outcomes-Based Education (OBE), Ignatian Pedagogical Paradigm (IPP), and the 5Es inquiry framework, implemented in ED 11 - Educational Technology 1 at Xavier University – Ateneo de Cagayan, Philippines, during the 2024–2025 academic year. Data were collected from 50 pre-service teachers (N = 50 for surveys and seatwork, N = 44 for pretest/posttest) and 20 semi-structured interviews (N = 10 per term). Results are organized by the four research questions (RQs), with quantitative data (surveys, pretest/posttest, seatwork) and qualitative themes (interviews) integrated to provide a comprehensive analysis. The discussion interprets findings, reflects on limitations, and relates results to existing literature and theoretical contributions.

Impact on Academic Performance (RQ1)

A Wilcoxon signed-rank test, conducted due to non-normal data (Shapiro-Wilk, $p < .05$), compared pretest and posttest scores (N = 44) on technology integration skills (e.g., digital lesson planning, software use). Scores increased from pretest (M = 51.91, SD = 6.12) to posttest (M = 56.32, SD = 5.88), with $Z = -3.421$, $p < .001$, and effect size $r = -0.621$ (large effect). Table 2 presents these results.

Corresponding email: rquileste@xu.edu.ph

Journal of Education and Teaching (JET) Volume 6 No. 3, 2025
DOI: 10.51454/jet.v6i3.687

Table 2. Wilcoxon Signed-Rank Test for Pretest and Posttest Scores (N = 44)

Measure	Mean (M)	Standard Deviation (SD)	Z-Statistic	p-Value	Effect Size (r)
Pretest	51.91	6.12			
Posttest	56.32	5.88	-3.421	< .001	-0.621

Note: Two-tailed test, large effect (r > 0.5).

Qualitative data supported this, with the midterm theme Cognitive Engagement noting enhanced critical thinking in technology tasks (e.g., "Testing authoring tools sparked critical thinking" [P3]), directly aligning with improved posttest scores.

Influence on Student Engagement (RQ2)

Midterm surveys (N = 50, 5-point Likert scale: 1 = Strongly Disagree, 5 = Strongly Agree) assessed engagement across four domains: Cognitive/OBE, Behavioral/IPP, Emotional/5Es, and Spiritual/Integration. Results showed: Cognitive (Mdn = 3.80, IQR = 0.50, 28% positive [scores ≥4]), Behavioral (Mdn = 3.70, IQR = 0.60, 26% positive), Emotional (Mdn = 3.80, IQR = 0.68, 28% positive), and Spiritual (Mdn = 3.75, IQR = 0.60, 28% positive). Spearman's correlations indicated strong inter-domain relationships (r_s = 0.874–0.945, $p < .001$). Survey-seatwork correlations (Modules 1–3, Mdn = 30, IQR = 0, N = 50) were weak (r_s = 0.003–0.105, non-significant).

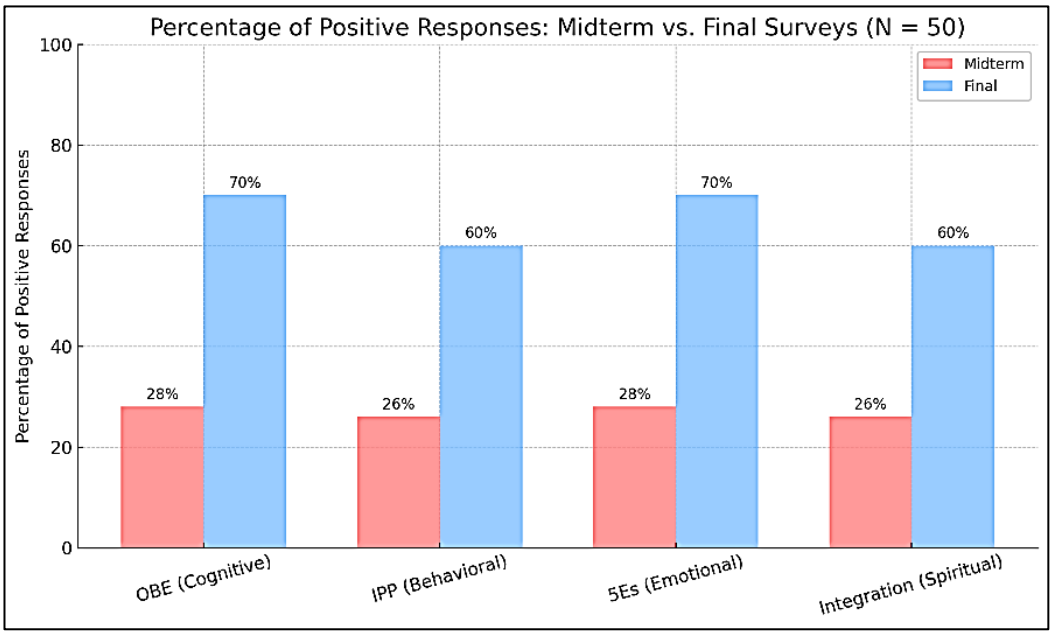

Figure 2. Percentage of Positive Responses (Scores ≥4) in Midterm and Final Surveys Across Domains (N = 50).

Midterm interviews (N = 10) identified five themes: Cognitive Engagement ("Testing authoring tools sparked critical thinking" [P3]), Behavioral Participation ("Group tasks encouraged collaboration" [P5]), Emotional Connection ("Learning tech was exciting" [P7]), Spiritual Growth ("Tech aligned with teaching values"

Corresponding email: rquileste@xu.edu.ph

[P1]), and Need for More Time ("Exploration needed longer sessions" [P9]). These themes triangulate with survey data, as Cognitive Engagement and Emotional Connection reflect moderate survey scores (Mdn = 3.70–3.80), while Need for More Time explains weak survey-seatwork correlations. Table 3 details survey descriptive statistics for midterm and final assessments, and Table 4 summarizes interview themes with example extracts.

Table 3. Midterm and Final Survey Descriptive Statistics (N = 50)

Domain	Midterm Mdn	Midterm IQR	Midterm % Positive	Final Mdn	Final IQR	Final % Positive
Cognitive/OBE	3.80	0.50	28%	4.00	0.20	70%
Behavioral/IPP	3.70	0.60	26%	4.00	0.20	60%
Emotional/5Es	3.80	0.68	28%	4.00	0.28	70%
Spiritual/Integration	3.75	0.60	28%	4.00	0.20	60%

Note: Positive = scores ≥4.

Table 4. Midterm and Final Interview Themes and Extracts (N = 10 per term)

Term	Theme/Subtheme	Example Extract
Midterm	Cognitive Engagement	"Testing authoring tools sparked critical thinking" (P3)
	Behavioral Participation	"Group tasks encouraged collaboration" (P5)
	Emotional Connection	"Learning tech was exciting" (P7)
	Spiritual Growth	"Tech aligned with teaching values" (P1)
	Need for More Time	"Exploration needed longer sessions" (P9)
Final	Perceived Alignment in OBE	"Outcomes matched activities clearly" (P3)
	Value of IPP	"Journaling clarified my teaching goals" (P6)
	5Es as Active Learning	"Exploring tools was hands-on" (P8)
	Holistic Growth	"All parts felt connected" (P2)
	Recommendations	"Clearer 5Es guidance would help" (P10)

Feedback on I-COPE's Effectiveness (RQ3)

Final surveys (N = 50) revealed improved feedback across domains: Cognitive (Mdn = 4.00, IQR = 0.20, 70% positive), Behavioral (Mdn = 4.00, IQR = 0.20, 60% positive), Emotional (Mdn = 4.00, IQR = 0.28, 70% positive), and Spiritual (Mdn = 4.00, IQR = 0.20, 60% positive). Spearman's correlations remained strong ($r_s = 0.721–0.945$, $p < .001$), but survey-seatwork correlations (Modules 4–6, Mdn = 30, IQR = 0, N = 50; $r_s = 0.021–0.098$, non-significant) indicated persistent assessment challenges. Final interviews (N = 10) yielded five themes: Perceived Alignment in OBE ("Outcomes matched activities clearly" [P3]), Value of IPP ("Journaling clarified my teaching goals" [P6]), 5Es as Active Learning ("Exploring tools was hands-on" [P8]), Holistic Growth ("All parts felt connected" [P2]), and Recommendations ("Clearer 5Es guidance would help" [P10]). These themes align

Corresponding email: rquileste@xu.edu.ph

with survey improvements, as Perceived Alignment and 5Es as Active Learning corroborate high Cognitive and Emotional scores (Mdn = 4.00), while Recommendations suggests areas for refinement. Table 3 presents detailed survey statistics, and Table 4 provides theme extracts for midterm and final interviews.

Interview themes (Holistic Growth, Perceived Alignment in OBE) confirmed synergy, as participants noted I-COPE's integrated design connected technical skills with reflective practices (e.g., "I-COPE's parts felt connected" [P2]).

Interaction of OBE, IPP, and 5Es (RQ4)

The Spiritual/Integration domain showed midterm (Mdn = 3.75, 28% positive) and final (Mdn = 4.00, 60% positive) improvements, with strong correlations to other domains (r_s = 0.874–0.945 midterm, 0.721–0.945 final, $p < .001$). Interview themes (Holistic Growth, Perceived Alignment in OBE) confirmed synergy, as participants noted I-COPE's integrated design connected technical skills with reflective practices (e.g., "I-COPE's parts felt connected" [P2]).

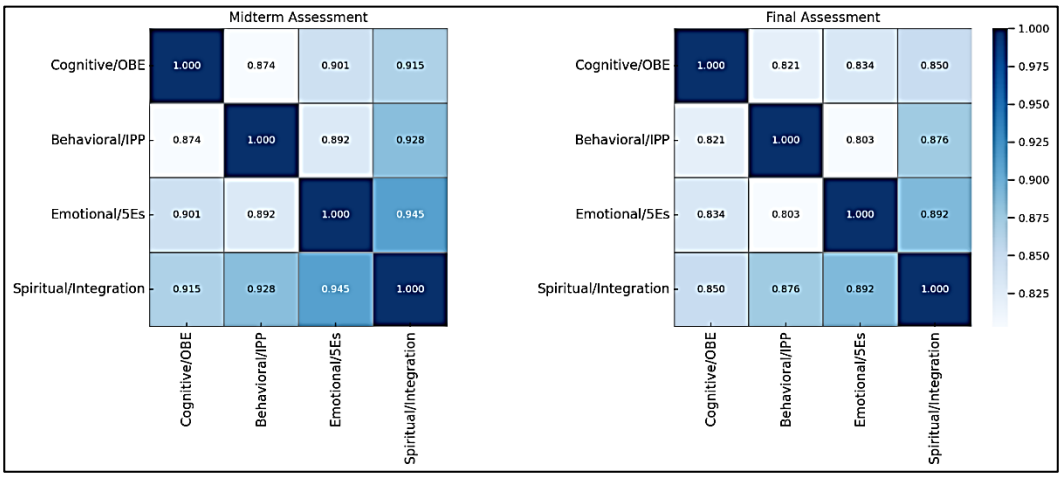

Figure 3. Spearman's Correlations Between Survey Domains at Midterm and Final Assessments (N = 50).

Discussion

Academic Impact of I-COPE

The I-COPE model significantly enhanced pre-service teachers' technology integration skills, aligning with OBE's structured outcomes (Barrot, 2021). The notable improvement in posttest scores over pretest reflects the model's effectiveness in fostering competencies like digital lesson planning and software use. Qualitative data reinforced this, with the Cognitive Engagement theme from midterm interviews (e.g., "Testing authoring tools sparked critical thinking" [P3]) directly supporting the quantitative gains. This triangulation suggests that 5Es' inquiry-based activities, such as exploring tools like Canva, facilitated practical skill development, while OBE's clear SLOs ensured focused learning outcomes (Bybee, 2019). The model's ability to bridge technical proficiency with structured

Corresponding email: rquileste@xu.edu.ph

pedagogy addresses gaps in Philippine teacher education, where resource constraints often limit hands-on training (DepEd, 2019).

Engagement and Feedback Dynamics

I-COPE fostered growing engagement across cognitive, behavioral, emotional, and spiritual domains, with survey results showing a shift from moderate to strong positive responses by the final term. Midterm interviews (Behavioral Participation, "Group tasks encouraged collaboration" [P5]; Emotional Connection, "Learning tech was exciting" [P7]) aligned with survey data, indicating that 5Es' hands-on activities motivated students, while IPP's journaling deepened engagement (Lucas, 2020). Final survey improvements, corroborated by themes like Perceived Alignment in OBE ("Outcomes matched activities clearly" [P3]) and 5Es as Active Learning ("Exploring tools was hands-on" [P8]), highlight I-COPE's ability to sustain engagement. However, weak survey-seatwork correlations suggest assessment limitations, as seatwork tasks may not fully capture engagement nuances. This triangulation underscores I-COPE's strength in fostering multidimensional engagement, though refinements are needed to align assessments with student experiences.

Synergy of I-COPE Components

The integration of OBE, IPP, and 5Es created a synergistic learning environment, as evidenced by strong inter-domain correlations and the Holistic Growth theme ("I-COPE's parts felt connected" [P2]). OBE's structured SLOs provided clarity, 5Es' inquiry stages promoted active learning, and IPP's reflective practices fostered ethical awareness, aligning with Jesuit educational values (Lucas, 2020). The Value of IPP theme ("Journaling clarified my teaching goals" [P6]) complemented high Spiritual/Integration scores, indicating that reflection enhanced values-driven teaching. This synergy addresses fragmented pedagogical approaches in Philippine teacher education, offering a cohesive model for technology integration (Fullan & Langworthy, 2021).

Critical Reflections and Limitations

While I-COPE demonstrated effectiveness, critical reflection reveals limitations. Weak survey-seatwork correlations indicate ceiling effects in seatwork scores, suggesting tasks lacked sufficient challenge to differentiate performance, potentially skewing engagement measures. *The Need for More Time* theme from interviews highlights that 5Es exploration phases were too brief for some students, limiting deeper inquiry. An unexpected outcome was the strong spiritual engagement in the Jesuit context, which may not generalize to non-Jesuit settings, raising questions about I-COPE's adaptability. These limitations suggest a need for diversified assessments, extended inquiry time, and broader testing to enhance scalability. Despite these challenges, I-COPE's alignment with CHED and PPST standards positions it as a promising model, with potential for refinement to address global teacher education needs (Sosu & Santoro, 2020).

Corresponding email: rquileste@xu.edu.ph

CONCLUSION

This mixed-methods study provides the first empirical evaluation of the I-COPE model, which integrates Outcomes-Based Education (OBE), the Ignatian Pedagogical Paradigm (IPP), and the 5Es inquiry framework in pre-service teacher education. Findings demonstrate that I-COPE significantly enhanced technology integration skills, strengthened engagement across cognitive, behavioral, emotional, and spiritual domains, and fostered values-driven teaching. These outcomes suggest that structured outcomes (OBE), inquiry-based learning (5Es), and reflective practice (IPP) can operate synergistically to address persistent challenges in teacher preparation. At the same time, limitations must be acknowledged. Survey-seatwork correlations were weak, indicating the need for more robust assessment strategies. The study was conducted in a single Jesuit university with a relatively small sample, raising questions about generalizability. Furthermore, strong spiritual engagement may reflect the Jesuit context and may not fully translate to other institutional or cultural settings. Despite these constraints, the I-COPE model contributes a valuable framework for rethinking teacher education in resource-constrained environments. It demonstrates how technical proficiency, critical inquiry, and ethical formation can be intentionally integrated, offering lessons not only for Philippine institutions but also for global efforts to prepare teachers for technology-rich, values-conscious classrooms.

Recommendations

The findings of this study point to several recommendations for improving the implementation of the I-COPE model and guiding future research on teacher education in technology integration.

For Pedagogical Practice

Diversify Assessments: To address limitations observed in seatwork tasks, educators should employ a variety of assessment methods, including open-ended projects, peer evaluations, and digital portfolios. Such diversity would better capture nuanced student learning, reduce ceiling effects, and align assessments with the multidimensional goals of I-COPE.

Extend Inquiry Time: Student feedback highlighted the need for more time during the *Explore* and *Elaborate* phases of the 5Es framework. Allowing extended hands-on engagement with digital tools can deepen inquiry, support critical problem-solving, and foster higher levels of technological proficiency.

Clarify 5Es Guidance: Detailed instructions for each stage of the 5Es inquiry model should be provided. Practical prompts, exemplars, or scaffolding activities can help students navigate the inquiry cycle more effectively, ensuring that each phase contributes to both skill acquisition and reflective growth.

Corresponding email: rquileste@xu.edu.ph

For Future Research

Longitudinal Studies: Further research should investigate I-COPE's long-term influence on teacher practice. Following graduates into their professional teaching careers can reveal whether the model's impact on technology integration, reflection, and values-driven pedagogy is sustained over time.

Cross-Context Adaptation: Since this study was conducted in a Jesuit Philippine context, replication in public, private, and international teacher education institutions is necessary to assess the model's adaptability and cultural transferability. Comparative studies across diverse settings can clarify which elements of I-COPE are universally effective and which are context-dependent.

Refinement of Assessment Tools: Alternative measurement strategies should be explored to strengthen alignment between engagement, performance, and reflection. Performance-based tasks, digital portfolios, and mixed-method joint displays could provide richer data on student learning processes and outcomes, improving the evaluative rigor of I-COPE.

REFERENCES

Akker, J. van den. (2018). Curriculum design principles for quality outcomes-based education. *Journal of Curriculum Studies, 50*(6), 686–704. https://doi.org/10.1080/00220272.2018.1501356

Barrot, J. S. (2021). Implementing outcomes-based education in the Philippines: Perspectives and challenges. *Asia Pacific Education Researcher, 30*(5), 465–475. https://doi.org/10.1007/s40299-021-00581-2

Bautista, M. A., & Torres, J. M. (2021). Outcomes-based education implementation: A Philippine higher education perspective. *Philippine Educational Review, 27*(1), 33–49. https://doi.org/10.1080/00377627.2021.1876543

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Psychology, 16*(3), 343–360. https://doi.org/10.1080/14780887.2019.1621596

Brush, T., & Glazewski, K. (2020). Designing technology-enhanced inquiry-based learning environments in teacher education. *Journal of Technology and Teacher Education, 28*(2), 173–182. https://www.learntechlib.org/p/215664/

Bybee, R. W. (2019). Using the 5E instructional model to advance science teacher education. *Science & Education, 28*(3–5), 405–421. https://doi.org/10.1007/s11191-019-00045-4

Cheng, E. C. K., & Chan, K. K. (2022). Reflective practice in teacher professional development: A comparative study. *Teacher Development, 26*(3), 345–362. https://doi.org/10.1080/13664530.2022.2052719

Commission on Higher Education. (2017). *CMO No. 74, s. 2017: Policies, standards, and guidelines for Bachelor of Secondary Education.*

Corresponding email: rquileste@xu.edu.ph

https://ched.gov.ph/wp-content/uploads/2017/10/CMO-No.-74-s.-2017.pdf

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

Darling-Hammond, L., & Hyler, M. E. (2020). Preparing educators for the time of COVID … and beyond. *European Journal of Teacher Education, 43*(4), 457–465. https://doi.org/10.1080/02619768.2020.1816961

Department of Education. (2019). *Philippine education for all 2015 review report.* https://www.deped.gov.ph/wp-content/uploads/2019/08/EFA-2015-Review-Report-Philippines.pdf

Dizon, R. P., & Orlanda, M. A. (2021). Active learning strategies in teacher education: Impact on pre-service teachers' engagement. *Philippine Journal of Education, 100*(2), 45–56. https://doi.org/10.1080/01195647.2021.1892345

Ertmer, P. A., & Newby, T. J. (2018). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly, 31*(2), 91–113. https://doi.org/10.1002/piq.21243

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2019). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education, 51*(3), 256–274. https://doi.org/10.1080/15391523.2019.1594178

Flores, M. A., & Swennen, A. (2020). The COVID-19 pandemic and its effects on teacher education. *European Journal of Teacher Education, 43*(4), 453–456. https://doi.org/10.1080/02619768.2020.1824253

Fullan, M., & Langworthy, M. (2021). A rich seam: How new pedagogies find deep learning. *Journal of Educational Change, 22*(4), 487–504. https://doi.org/10.1007/s10833-021-09423-7

Garrison, D. R., & Akyol, Z. (2019). Toward the development of a metacognition construct for communities of inquiry. *Internet and Higher Education, 42,* 66–71. https://doi.org/10.1016/j.iheduc.2019.04.001

Guetterman, T. C., & Fetters, M. D. (2020). Integrating quantitative and qualitative results in health science mixed methods research through joint displays. *Journal of Mixed Methods Research, 14*(2), 165–187. https://doi.org/10.1177/1558689819828237

Koh, J. H. L., & Tan, C. (2022). Technology-enhanced teacher education: A global perspective. *Educational Technology Research and Development, 70*(3), 921–944. https://doi.org/10.1007/s11423-022-10112-3

Korthagen, F. A. J. (2017). Inconvenient truths about teacher learning: Towards professional development 3.0. *Teachers and Teaching, 23*(4), 387–405. https://doi.org/10.1080/13540602.2016.1211523

Leithwood, K., & Jantzi, D. (2020). Transformative leadership effects on teacher engagement: A multilevel analysis. *Educational Administration Quarterly, 56*(4), 611–644. https://doi.org/10.1177/0013161X19880684

Corresponding email: rquileste@xu.edu.ph

Loughran, J. (2019). Pedagogical reasoning: Understanding teacher decision making in complex settings. *Teaching and Teacher Education, 85,* 1–9. https://doi.org/10.1016/j.tate.2019.06.002

Lucas, M. P. (2020). Ignatian pedagogy in Philippine teacher education: A case study approach. *International Journal of Educational Research, 104,* Article 101678. https://doi.org/10.1016/j.ijer.2020.101678

Magno, C., & Barrot, J. S. (2020). Technology integration in Philippine teacher education: Challenges and prospects. *Journal of Educational Technology Systems, 49*(2), 215–235. https://doi.org/10.1177/0047239520941598

Merriam, S. B., & Grenier, R. S. (2019). *Qualitative research in practice: Examples for discussion and analysis* (2nd ed.). Jossey-Bass.

Mishra, P., & Koehler, M. J. (2016). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 118*(6), 1–24. https://doi.org/10.1177/016146811611806O6

Orencia, M. A., & Dizon, R. P. (2021). Inquiry-based learning in pre-service teacher education: A Philippine perspective. *Asia-Pacific Journal of Teacher Education, 49*(4), 387–402. https://doi.org/10.1080/1359866X.2020.1811845

Pantić, N., & Wubbels, T. (2022). Teacher agency in professional learning communities. *Professional Development in Education, 48*(3), 467–481. https://doi.org/10.1080/19415257.2020.1777370

Philippine Professional Standards for Teachers. (2017). *National adoption and implementation of the PPST.* Department of Education. https://www.deped.gov.ph/wp-content/uploads/2017/08/DO_s2017_042.pdf

Scherer, R., & Teo, T. (2021). Unpacking teachers' intentions to integrate technology: A meta-analysis. *Educational Research Review, 33,* Article 100369. https://doi.org/10.1016/j.edurev.2021.100369

Schön, D. A., & DeSanctis, V. (2020). Reflective practice in teacher education: Revisiting Schön's legacy. *Teaching and Teacher Education, 94,* Article 103129. https://doi.org/10.1016/j.tate.2020.103129

Sosu, E. M., & Santoro, N. (2020). Addressing equity in teacher education: Global challenges and local solutions. *Journal of Teacher Education, 71*(4), 391–403. https://doi.org/10.1177/0022487119875712

Terry, G., & Hayfield, N. (2021). Essentials of thematic analysis. *Qualitative Research in Psychology, 18*(1), 1–22. https://doi.org/10.1080/14780887.2020.1808854

Tondeur, J., & van de Velde, S. (2020). Technology integration in teacher education: A systematic review. *Computers & Education, 147,* Article 103779. https://doi.org/10.1016/j.compedu.2019.103779

Tondeur, J., van Braak, J., Sang, G., Voogt, J., Fisser, P., & Ottenbreit-Leftwich, A. (2017). Preparing pre-service teachers to integrate technology in education: A synthesis of qualitative evidence. *Computers & Education, 104,* 1–17. https://doi.org/10.1016/j.compedu.2016.11.009

Corresponding email: rquileste@xu.edu.ph

Torres, J. M., & Magno, C. (2019). Technology adoption in Philippine higher education: A qualitative analysis. *Higher Education Research & Development, 38*(6), 1267–1282. https://doi.org/10.1080/07294360.2019.1623212

Voogt, J., & Roblin, N. P. (2017). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies, 49*(6), 773–792. https://doi.org/10.1080/00220272.2017.1333749

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.

Zeichner, K., & Payne, K. A. (2021). Democratic teacher education in an era of standardization. *Journal of Teacher Education, 72*(1), 14–26. https://doi.org/10.1177/0022487120948039

Corresponding email: rquileste@xu.edu.ph