

Innovative Hybrid Peer-Teaching Learning Model Using Interactive Video and Simulation to Promote Professional Self-Efficacy and Clinical Competence Among Nursing Students

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ABSTRACT: *This study aimed to develop and evaluate a peer-teaching instructional model integrating interactive video and simulation to strengthen self-efficacy in delivery care and clinical competence among undergraduate nursing students. The study was conducted in response to persistent challenges in preparing students for childbirth procedures, particularly reduced confidence and insufficient readiness frequently reported in simulation-based learning environments. A quasi-experimental design was employed involving 60 fourth-year nursing students enrolled in a maternal and newborn nursing practicum course. Participants were purposively assigned to either an experimental group (peer teaching with Edpuzzle-supported interactive videos and simulation practice) or a control group (traditional instruction with video viewing and instructor-led simulation). The research instruments included a lesson plan, a self-efficacy scale, a clinical skills checklist, and a satisfaction questionnaire. Data were analyzed using descriptive statistics, independent t-tests, and Pearson's correlation coefficient.*

The experimental group showed significantly higher self-efficacy ($M = 4.29$, $SD = 0.42$) than the control group ($M = 3.89$, $SD = 0.55$), $p < .003$. Clinical skills scores were also significantly higher in the experimental group ($M = 3.85$, $SD = 0.39$) compared to the control group ($M = 3.43$, $SD = 0.23$), $p < .001$. Students reported high satisfaction with the peer-teaching approach ($M = 4.72$, $SD = 0.40$). Strong positive correlations were found between self- and peer-assessments ($r = 0.70$, $p < .001$), while instructor ratings were not significantly correlated with student assessments. The findings support the effectiveness of technology-supported peer teaching in improving students' confidence and clinical performance in delivery care. However, these findings are limited to a single institution and short-term evaluation period. This model offers a promising strategy for competency-based nursing education.

Keywords: Peer Teaching, Simulation-Based Learning, Interactive Video, Self-Efficacy, Clinical Competence

1. Introduction

The Thai National Education Plan (2017–2036) emphasizes the development of 21st-century skills on the part of students, particularly in health professions such as nursing. To meet this objective, the Thailand Nursing and Midwifery Council mandates that educational institutions produce graduates equipped with both theoretical knowledge and practical competencies in accordance with professional standards and ethical practices (Thailand Nursing and Midwifery Council, 2020a, 2020b). Nursing educators at the tertiary level are therefore encouraged to adopt adult learning principles and promote transformative learning experiences (Jeranukul, 2018).

In clinical practice courses, especially labor and delivery, nursing students often experience heightened anxiety due to the life-critical nature of the tasks involved. These emotional burdens can negatively affect students' learning processes and self-efficacy (Lertsakornsiri, 2015). Accordingly, active learning strategies are increasingly recommended to foster deeper engagement, critical thinking, and hands-on practice. Despite the adoption of active learning approaches, many nursing programs continue to report persistent gaps in students' confidence, readiness, and performance when engaging in high-stakes clinical procedures such as childbirth. These limitations indicate the need for an instructional model that combines structured guidance, peer support, and technology-enhanced preparation to better strengthen students' self-efficacy and clinical competence before entering real practice.

According to constructivist and social learning theories, learners actively build knowledge through observation, interaction, and reflection. These principles are embedded in peer-teaching and simulation-based activities, where students alternate between roles as learners and teachers, reinforcing learning through social engagement.

Peer teaching is a validated active learning technique that facilitates mutual knowledge exchange and reduces performance anxiety. It has been found to increase both confidence and clinical performance, especially in skill intensive areas such as childbirth (Lertwanawattana et al., 2015; Nakanakupt & Jaichuen, 2022). In peer teaching student-tutors reinforce their understanding by teaching others, while learners benefit from relatable explanations and a more relaxed learning atmosphere. This method not only enhances cognitive outcomes but also strengthens professional communication, empathy, decision-making, and collaboration skills (Bowyer & Shaw, 2021; Tanveer et al., 2023). Recent studies have also reported that peer-assisted learning and technology-enhanced instructional strategies continue to improve students' confidence, clinical decision-making, and procedural performance in nursing education (Tanveer et al., 2023; Yiin & Chern, 2023; Platt et al., 2024). Building on these pedagogical benefits, blended learning has emerged as a complementary approach that integrates digital preparation with hands-on practice.

To further enhance these benefits, blended learning has emerged as a promising approach in nursing education. It offers flexibility by allowing students to engage with online content at their own pace, promoting better time management and encouraging self-directed learning through interactive digital platforms (Ashipala et al., 2024). When structured sequentially, beginning with virtual simulations followed by high-fidelity clinical practice, blended learning has been shown to enhance reflective thinking and learner confidence (Park et al., 2022). Recent international studies further confirm these trends, demonstrating the effectiveness of peer-assisted and blended-simulation approaches in enhancing self-efficacy and performance among nursing students (Tanveer et al., 2023; Ashipala et al., 2024; Platt et al., 2024). Moreover, repeated immersive simulation experiences have been associated with improvements in knowledge and self-efficacy among undergraduate nursing students, supporting the role of blended approaches in skill acquisition (Platt et al., 2024).

Previous studies on peer-teaching and simulation have demonstrated improvements in confidence and performance; however, most were conducted in single courses, lacked systematic integration with digital tools, or did not measure long-term outcomes. These limitations highlight the need for a more comprehensive hybrid approach that combines constructivist and social learning principles with technology-enhanced simulation. Given these advantages, this study explores the integration of peer teaching with simulation and interactive video in childbirth education. The goal is to promote delivery-related self-efficacy and clinical competence among undergraduate nursing students, thereby contributing to safer maternal care and elevating national healthcare standards.

2. Research Objectives

This study aims to examine the effectiveness of peer teaching integrated with interactive video and simulation in terms of delivery-related learning outcomes among undergraduate nursing students. Specifically, the research addresses the following questions:

1. To what extent does peer teaching affect nursing students' self-efficacy with regard to performing delivery procedures compared to traditional instruction?
2. How do clinical skills in performing delivery procedures differ between students who receive peer teaching and those who receive traditional instruction?
3. What is the level of student satisfaction with regard to the peer teaching method?
4. How do self-assessment, peer assessment, and instructor assessment compare in terms of evaluating students' delivery skills?

3. Materials and Methods

3.1 Research Design

This study employed a quasi-experimental design using a two-group pretest-posttest approach to examine the effects of peer teaching on childbirth confidence and performance on the part of nursing students.

3.2 Participants

The participants consisted of 60 fourth-year undergraduate nursing students enrolled in the course "Maternal and Newborn Nursing and Midwifery Practice 3" at Princess Agrarajakumari Faculty of Nursing, Chulabhorn Royal Academy during the first semester of the academic year 2024 (September–November 2024). Inclusion criteria were: (1) enrollment in the targeted course, (2) completion of both theoretical courses in maternal and newborn nursing, and (3) voluntary participation in the study. No participants withdrew, and all 60 completed the full study.

Participants were assigned to two groups based on their practicum schedule, which was predetermined by the academic curriculum. The control group ($n = 30$) completed their practicum between September and October 2024, while the experimental group ($n = 30$) underwent the intervention between October and November 2024.

The primary instructional distinction during practicum sessions was that the experimental group engaged in structured peer-teaching cycles supported by interactive video preparation, whereas the control group relied solely on instructor-led demonstrations and supervised practice without peer-led components.

3.3 Research Instruments

This study employed three categories of instrument: instructional materials, assessment tools, and a feedback instrument. All instruments were reviewed by three experts to establish content validity, with Item-Objective Congruence (IOC) values reported below.

1. Instructional Materials

Peer Teaching Lesson Plan: Developed to promote professional self-efficacy through structured peer-led activities (IOC = 0.86). Learning Videos: Two types of instructional videos were provided: (a) non-interactive Lenia-format videos for passive viewing, and (b) interactive videos created with the Edpuzzle platform. The Edpuzzle videos contained embedded questions and reflective prompts to enhance learner engagement. Seven interactive modules were used, validated in a previous study (Nakanakupt & Jaichuen, 2022) were used, achieving an IOC of 1.00 across 21 items and instructional effectiveness scores ($E1/E2 = 83.21/86.61$).

2. Assessment Tools

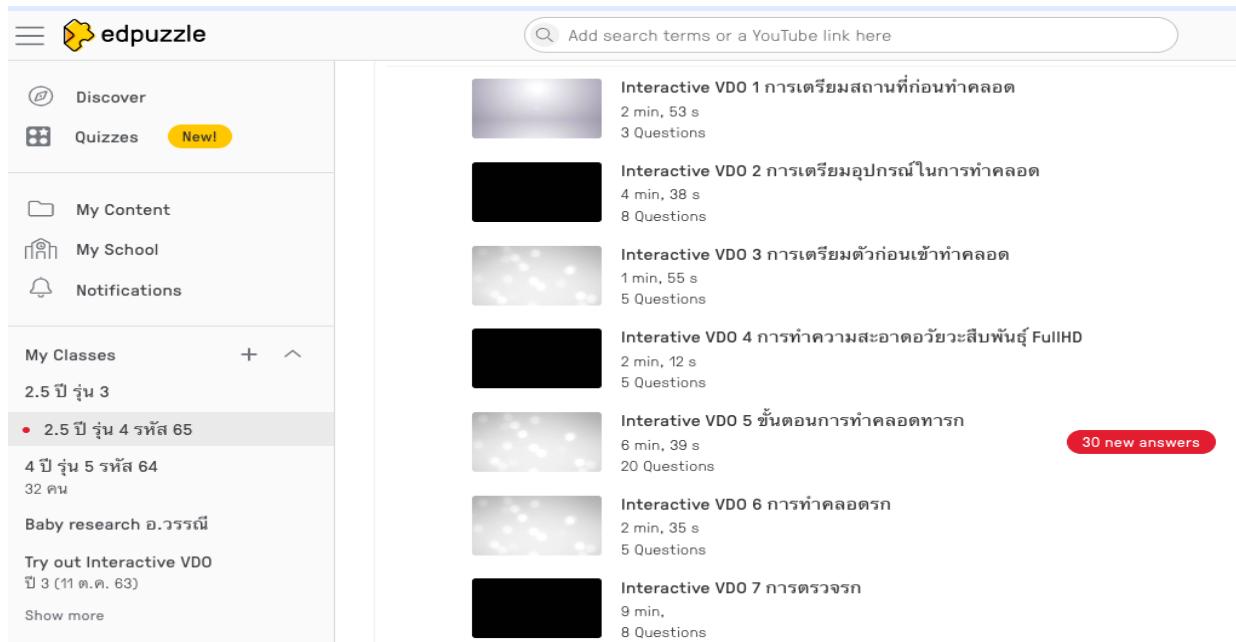
Professional Self-Efficacy: This refers to the Childbirth Self-Efficacy Questionnaire, an 8-item self-assessment instrument designed to evaluate nursing students' confidence in performing childbirth procedures (IOC = 0.96). Clinical Competence Assessment: Assessed using the Delivery Performance Checklist, a 13-item checklist developed to evaluate students' delivery skills during simulation-based practice. It was utilized in self-assessment, peer assessment, and instructor assessment (IOC = 1.00).

3. Feedback Instrument

Student Satisfaction Questionnaire: Designed to assess satisfaction with the peer-teaching approach in both classroom and clinical practice settings (IOC = 0.92).

4. Intervention Procedure

The intervention lasted for four consecutive weeks, totaling approximately 28 contact hours (7 hours per week). All participants had previously completed theoretical coursework in childbirth. Prior to the practicum, students were provided with self-directed learning materials in the form of instructional videos. These included both non-interactive formats and seven interactive modules delivered via the Edpuzzle platform (Figure 1). Each video corresponded to a key step in the childbirth procedure and featured guiding annotations, visual highlights, and embedded formative questions to support learner comprehension and engagement (Figure 2). Students were required to complete all modules at home within one week prior to entering the simulation environment. An example of such multimedia questioning involved scenario-based multiple-choice questions that assessed the correct technique for fetal head rotation (Figure 3). The experimental group participated in a peer-teaching intervention integrated into the practicum. Each day, students in this group engaged in a 7-hour session. They were organized into subgroups of 2–3 members, drawn from a larger practicum group of 7–8 students. The daily session began with a demonstration led by two volunteer students, who performed the childbirth procedure while the remaining peers and the supervising instructor observed, provided feedback, exchanged ideas, and discussed correct techniques collaboratively. During the subsequent four-hour simulation practice, students worked in their small subgroups to repeatedly rehearse the procedure, offering mutual support and peer guidance. The instructor circulated among groups, providing corrective feedback as needed to ensure clinical accuracy. After the lunch break, each student underwent an individual skills assessment conducted by the instructor, lasting approximately 10–15 minutes per student. The session concluded with a structured debriefing that encouraged students to reflect on their performance, share insights, and identify areas for improvement. Peer tutors provided ongoing support throughout the day, including demonstrations, clarification of procedural steps, and formative feedback, all within the framework guided by the instructor. Students rotated among the roles of performer, assistant, and peer tutor within their subgroup, allowing for active participation and skill development from multiple perspectives. A typical peer-teaching session with manikin-based childbirth simulation is illustrated in Figure 4. The control group received conventional instructor-led training without the peer-teaching component. Both groups followed the same practicum schedule and used identical instructional materials and assessment tools. Instructor contact hours and teaching time were equivalent for both groups to ensure parity in instructional exposure.



The screenshot shows the Edpuzzle platform interface. On the left, a sidebar displays navigation links: Discover, Quizzes (with a 'New!' badge), My Content, My School, and Notifications. Below these are sections for 'My Classes' (listing '2.5 ปี ชั้น 3' and '2.5 ปี ชั้น 4 รหัส 65' with a red dot), 'Baby research อ.วารณี', 'Try out Interactive VDO ปี 3 (11 ต.ค. 63)', and a 'Show more' button. The main content area on the right lists seven interactive video modules, each with a thumbnail, title, duration, and question count:

- Interactive VDO 1 การเตรียมสถานที่ก่อนท่าคลอด (2 min, 53 s, 3 Questions)
- Interactive VDO 2 การเตรียมอุปกรณ์ในการท่าคลอด (4 min, 38 s, 8 Questions)
- Interactive VDO 3 การเตรียมตัวก่อนเข้าท่าคลอด (1 min, 55 s, 5 Questions)
- Interactive VDO 4 การท่าความสะอัดอ้วязะสีบพันธุ์ FullHD (2 min, 12 s, 5 Questions)
- Interactive VDO 5 ขั้นตอนการทำคลอดทารก (6 min, 39 s, 20 Questions) with a '30 new answers' badge
- Interactive VDO 6 การท่าคลอดทารก (2 min, 35 s, 5 Questions)
- Interactive VDO 7 การตรวจร่างกาย (9 min, 9 Questions)

Figure 1. Screenshot of the Edpuzzle interface displaying seven interactive video modules on childbirth procedures for self-directed learning.

MULTIPLE-CHOICE QUESTION

การสูบถุงเท้า ควรจับผ้าแบบใดเพื่อป้องกันการ contaminate?
(เลือกข้อที่ถูกได้หลายข้อ)

พับชายถุงเท้าให้ปิดมือไว้ กางนิ้วออก และตึงแยก ปากถุงเท้าให้กว้าง



MULTIPLE-CHOICE QUESTION

ควรใช้กรรไกรใดเพื่อตัดฝีเข็บ (episiotomy)?
(เลือกข้อที่ถูกได้เพียง 1 ข้อ)





Figure 2. Sample frame from the Edpuzzle module showing an embedded quiz question and annotated visual content to support active learning.



MULTIPLE-CHOICE QUESTION 100 / 100

จาก VDO ทางการรายนี้ อยู่ในท่าใด และช่วยหมุนจาก ที่ทารกสะบัดหน้าเพื่อชัดต่ออย่างไร?
(เลือกคตอบ 1 ข้อ)

ROA หมุนทวนเข็มนาฬิกา 45 องศา

ROA หมุนตามเข็มนาฬิกา 90 องศา

LOA หมุนทวนเข็มนาฬิกา 135 องศา

LOA หมุนตามเข็มนาฬิกา 135 องศา

[Need to ask or add anything?](#)

[Rewatch](#) [Skip](#) [Continue](#)

Figure 3. Interactive multiple-choice question embedded in Edpuzzle, asking learners to analyze correct hand positioning during fetal head rotation in childbirth simulation.

To provide a clearer overview of the intervention design, the instructional process was organized into five main phases, as summarized in Table 1.



Figure 4. Nursing students participating in simulation-based practice using childbirth manikins, working in peer-teaching roles at the Learning and Nursing Simulation Center (LRC).

Table 1. Summary of the Intervention Steps

Phase	Activity	Description
Pre-learning	Interactive video (Edpuzzle)	Students studied seven interactive video modules at home before practice.
Peer teaching	Demonstration & group practice	Students demonstrated and taught peers under instructor supervision.
Simulation	Manikin-based childbirth practice	Students practiced repeatedly in small subgroups to refine procedural skills.
Reflection	Debriefing & group discussion	Students reflected on their performance and shared insights.
Assessment	Skills evaluation	Performance was assessed by self, peer, and instructor checklists.

This structured sequence of activities guided both the experimental and control groups throughout the practicum, ensuring alignment between theoretical preparation and clinical performance.

3.4 Data Collection and Analysis

Data were collected at two time points: before and after the intervention. Professional self-efficacy was assessed using the Childbirth Self-Efficacy Questionnaire, and clinical competence was evaluated using the Delivery Performance Checklist at both stages. Paired-sample t-tests were conducted to analyze within-group differences, while independent-

sample *t*-tests were used to compare outcomes between the experimental and control groups. Descriptive statistics, including mean, standard deviation, and percentage, were employed to summarize students' satisfaction levels.

4. Results

This section presents the findings according to the study objectives. The results are organized into four parts: Professional Self-Efficacy outcomes, delivery performance comparison, student satisfaction, and inter-rater assessment correlations.

4.1 Professional Self-Efficacy

Both control and experimental groups demonstrated statistically significant improvement in childbirth self-efficacy scores after the intervention. Independent-sample *t*-tests indicated no significant difference in pre-test scores; however, post-test scores in the experimental group were significantly higher.

4.2 Effects of Peer-Teaching on Professional Self-Efficacy

This study investigated the impact of a peer-teaching instructional model on nursing students' self-efficacy in performing childbirth procedures. Sixty fourth-year nursing students were divided equally into a control group (traditional instruction) and an experimental group (peer teaching). A comparison of pre- and post-intervention self-efficacy scores was conducted both within and between groups.

As shown in Table 2, both groups exhibited statistically significant increases in self-efficacy scores after the intervention. Independent *t*-test results indicated that students in the experimental group showed a statistically significant increase in delivery self-efficacy compared with the control group ($p < .05$). The control group's mean score improved from 2.95 to 3.89 ($t(29) = -5.63, p < .001$), while the experimental group's score increased from 3.16 to 4.29 ($t(29) = -7.14, p < .001$). Notably, there was no significant difference between the groups at baseline ($p = .26$); however, a significant difference was found after the intervention, favoring the peer-teaching group ($t(58) = -3.12, p < .003$).

These findings suggest that while both instructional methods enhance self-efficacy in childbirth performance, peer teaching is more effective in boosting students' confidence.

Table 2. Comparison of Delivery Self-Efficacy Scores Within and Between Groups (n=30/30)

Comparison	Group	Pretest Mean (SD)	Posttest Mean (SD)	<i>t</i>	p-value
Within-group (Traditional)	Control	2.95 (0.68)	3.89 (0.55)	-5.63	< .001
Within-group (Peer Teaching)	Experimental	3.16 (0.73)	4.29 (0.42)	-7.14	< .001
Between-group (Pre-intervention)	Ctrl vs Exp	2.95 vs 3.16	—	-1.14	.26
Between-group (Post-intervention)	Ctrl vs Exp	—	3.89 vs 4.29	-3.12	< .003

Note. Ctrl = Control Group; Exp = Experimental Group

Figure 5 presents a visual comparison of the post-test self-efficacy scores between the control and experimental groups, illustrating the higher mean scores among students who participated in the peer-teaching model.

4.3 Effects of Peer-Teaching on Clinical Skill Performance in Childbirth

To evaluate the effectiveness of the peer-teaching model on clinical skill performance, a comparison was conducted between the control and experimental groups using a standardized childbirth checklist assessed by faculty experts. Both groups consisted of 30 fourth-year nursing students.

Figure 5. Comparison of Post-Test Self-Efficacy Scores

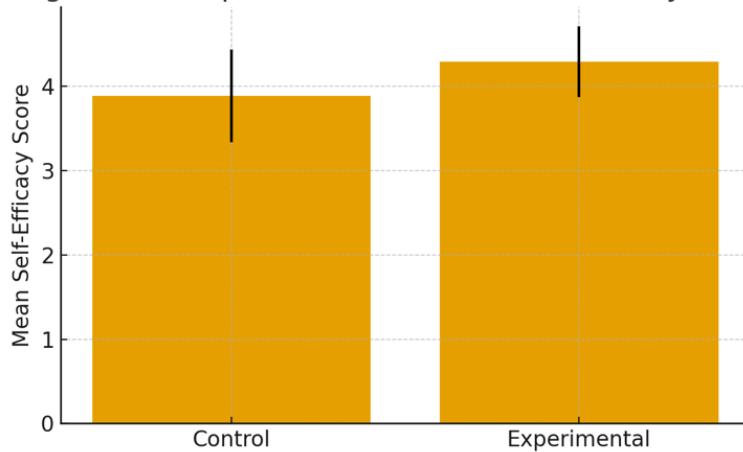


Figure 5. Comparison of post-test self-efficacy scores between the control and experimental groups.

As shown in Table 3, the experimental group demonstrated significantly higher clinical skill scores (Mean = 3.85, SD = 0.39) compared to the control group (Mean = 3.43, SD = 0.23). The difference was statistically significant ($t(58) = -5.11, p < .001$), indicating the positive impact of peer-teaching on students' practical competence in performing childbirth procedures.

Table 3. Comparison of Childbirth Skill Performance Between Groups (Posttest) (n = 30)

Group	Mean (SD)	t	p-value
Control	3.43 (0.23)	-5.11	< .001
Experimental	3.85 (0.39)		

Note. Post-intervention comparison of childbirth procedural skills assessed by faculty evaluators.

Figure 6 illustrates the comparison of clinical competence scores between the two groups, showing notably higher performance in the experimental group.

Figure 6. Comparison of Clinical Competence Scores

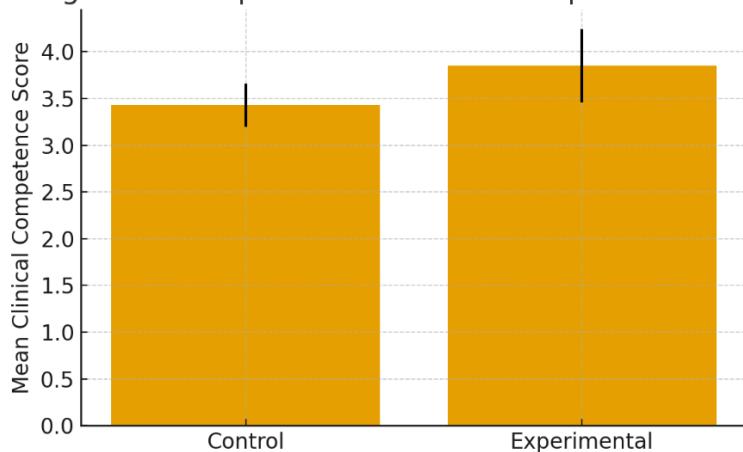


Figure 6. Comparison of clinical competence scores between the control and experimental groups.

4.4 Student Satisfaction With Regard to the Peer-Teaching Instructional Model

Student satisfaction was assessed on the part of 30 nursing students in the experimental group who participated in peer-teaching activities. Satisfaction was measured in three domains: classroom instruction, delivery simulation in the Learning Resource Center (LRC), and overall experience.

As presented in Table 4, students in the experimental group expressed a high level of satisfaction in all domains. The average satisfaction score for classroom instruction was 4.75 (SD = 0.40), followed by LRC-based delivery simulation at 4.71 (SD = 0.41), and overall satisfaction at 4.72 (SD = 0.40). All skewness values were negative, indicating a distribution leaning toward “highly satisfied”. Frequencies also showed that over 70% of students rated their satisfaction in the highest range (4.50–5.00).

These findings confirm that the peer-teaching instructional model was well-received and positively perceived by the participants.

Table 4. Student Satisfaction With Regard to Peer-Teaching (n = 30)

Satisfaction Domain	Mean (SD)	Skewness	Interpretation	% Rated 4.50–5.00
Classroom Instruction	4.75 (0.40)	-1.16	Highly satisfied	73.33%
Delivery Process (LRC)	4.71 (0.41)	-0.96	Highly satisfied	70.00%
Overall Satisfaction	4.72 (0.40)	-1.03	Highly satisfied	73.33%

As presented in Table 4, students in the experimental group reported high levels of satisfaction across all domains. In addition to quantitative findings, qualitative comments reinforced the positive learning experiences. One student noted, “Learning from peers who had more experience was very helpful and made me feel more confident.” Another explained, “Practicing together allowed us to review and correct our mistakes. My peers often had useful memory techniques that made the steps easier to understand than reading alone.” A third student shared, “The simulation-based preparation in the LRC reduced my anxiety and helped me feel more confident before the actual practice.”

4.5 Correlation of Delivery Skill Assessments Among Self, Peer, and Instructor Ratings

To investigate the alignment of skill assessments from different perspectives, correlation analysis was conducted among three sources: self-assessment, peer assessment, and instructor assessment, within the experimental group (n = 30).

As presented in Table 5, the results revealed a strong and statistically significant positive correlation between self-assessment and peer assessment ($r = .762, p < .001$). However, no significant correlation was found between peer and instructor assessment ($r = .233, p = .215$), or between self-assessment and instructor assessments ($r = .047, p = .807$).

These findings suggest that while students' self-perception with regard to skill was aligned with that of their peers', their evaluations did not correspond significantly with instructors' professional assessments. This discrepancy highlights a potential overestimation bias in self and peer-ratings, emphasizing the importance of triangulated evaluation methods in clinical skill assessment.

Table 5. Pearson Correlation Coefficients Among Self, Peer, and Instructor Assessments (n = 30)

Assessment Pair	Pearson r	p-value	Interpretation
Self vs. Peer	0.762	< .001	High correlation, statistically significant
Peer vs. Instructor	0.233	0.215	Not significant
Self vs. Instructor	0.047	0.807	Not significant

5. Discussion

This study investigated the effects of a peer-teaching instructional model integrating interactive video and simulation on undergraduate nursing students' self-efficacy, clinical competence, and satisfaction in performing childbirth procedures. The discussion is structured into four subsections to align with the research objectives.

The findings can be interpreted through Bandura's four sources of self-efficacy: mastery experience, vicarious experience, verbal persuasion, and emotional state. The peer-teaching model provided repeated simulation practice (mastery), opportunities to observe peers performing the procedure (vicarious experience), ongoing constructive feedback (verbal persuasion), and a supportive learning environment that reduced anxiety (emotional state). These mechanisms collectively contributed to the observed improvements in students' self-efficacy.

In this study, the interactive video component supported both mastery experience and vicarious learning by enabling students to repeatedly observe correct procedures and mentally rehearse each step at their own pace. Peer teaching further reinforced verbal persuasion through constructive feedback and encouragement, while the collaborative practice environment helped reduce anxiety and promote a positive emotional state. Together, these elements activated all four of Bandura's mechanisms and contributed to the improved self-efficacy observed in the experimental group.

5.1 Impact on Delivery Self-Efficacy

The findings revealed a significant increase in self-efficacy scores among students in the experimental group after the intervention. In this quasi-experimental design, the absence of a significant difference in pre-test self-efficacy scores indicates that the two groups were comparable at baseline in terms of their theoretical preparation and clinical exposure. This baseline equivalence supports the internal validity of the study and strengthens the inference that the greater gains observed in the experimental group are attributable to the peer-teaching and interactive video model rather than pre-existing differences between cohorts.

These results support Bandura's self-efficacy theory (Bandura, 1997), which emphasizes the influence of mastery experience and vicarious learning on efficacy beliefs. Peer teaching allowed students to alternate roles between performing, assisting, and observing, creating multiple pathways for modeling and self-reflection.

Consistent with this, Nakanakupt and Jaichuen (2022) demonstrated that interactive video learning led to enhanced confidence and knowledge among nursing students in childbirth care. Likewise, studies in the Thai context also confirm that emotional support and collaborative practice in safe learning environments help alleviate anxiety and build confidence, especially in high-stakes clinical situations (Lertsakornsiri, 2015; Wongtienlai, 2022). One student in this study commented: "I used to be scared of making mistakes during delivery, but after practicing with friends and watching the videos multiple times, I felt more confident when I actually tried it".

Furthermore, the flexibility of Edpuzzle-supported learning allowed students to pause, replay, and reflect at their own pace, aligning with principles of self-regulated learning and cognitive load management (Shorey & Lopez, 2020). This individualized pacing is particularly effective in skill-based learning where procedural steps must be internalized.

5.2 Improvement in Clinical Competence

The experimental group outperformed the control group in faculty-assessed childbirth skill performance. This reinforces the effectiveness of simulation-based practice and peer-led scaffolding in promoting clinical competence (Folkvord & Risa, 2022; Platt et al., 2024). When students teach or assist each other, they reinforce their cognitive schemas and procedural fluency, which aligns with constructivist learning theory and 4C/ID instructional design.

The rotation of roles within triads- performer, assistant, observer-mirrored real-life delivery room dynamics and promoted teamwork, decision-making, and psychomotor refinement. According to Lertwanawattana et al. (2015), peer-assisted strategies significantly improve academic performance and clinical outcomes by increasing engagement and reflection-on-action.

The integration of interactive video before simulation supported mental rehearsal and visualization, critical for complex psychomotor skills (Choi et al., 2021). Thai literature also reflects the importance of repeated practice, especially in maternity care, to bridge the gap between theory and practice (Neamsakul, 2017)

5.3 Student Satisfaction with the Peer Teaching Model

Participants in the experimental group reported high satisfaction with the peer-teaching approach. Key advantages cited were emotional comfort, increased practice time, and the relatability of peer instruction. This resonates with Thai cultural contexts, where supportive peer relationships foster a sense of community and mutual responsibility in learning (Wisalaskulwong & Sawangthuk, 2015).

One student remarked, “Practicing with friends made me feel less nervous than practicing in front of an instructor. We could ask each other questions without fear.” This environment aligns with adult learning principles and the Thai Nursing and Midwifery Council’s emphasis on student-centered, competency-based education (Thailand Nursing and Midwifery Council, 2020a, 2020b).

The Edpuzzle-enhanced video learning component was particularly well-received, with many students praising its interactive format. As one student noted: *‘The videos helped me understand better. I could go back and review before practicing. It felt like I had a private tutor.’* Evidence from randomized controlled trials confirms that technology-enhanced simulation improves knowledge, self-confidence, and satisfaction (Padilha et al., 2019). A systematic review further supports these findings, demonstrating consistent gains in learner motivation, knowledge retention, and skill development across nursing education contexts (Foronda et al., 2020). Thai nursing educators have also emphasized the importance of active, technology-supported learning environments in fostering engagement and skill retention (Wongtienlai, 2022).

5.4 Assessment Alignment and Evaluation Gaps

While self- and peer-assessment scores correlated moderately, there was limited agreement with instructor ratings. This suggests that students could reliably evaluate observable behaviors but may lack expertise in judging more nuanced dimensions such as safety prioritization, timing, or contingency handling—issues highlighted in studies on inter-rater bias and calibration (Pierce et al., 2024; Stenberg et al., 2021).

Such discrepancies call for improved assessment literacy and guided calibration sessions to reduce subjective variability. In the Thai setting, reflective debriefing and structured peer-feedback activities have been shown to enhance peer-assessment reliability and formative feedback quality (Pantrakool, 2020). A combination of faculty moderation, double marking, and real-time feedback could improve fairness and transparency in future assessments.

This hybrid model also demonstrates strong scalability and cost-effectiveness. Once the interactive video modules are developed, they can be reused across multiple cohorts with minimal instructor time, reducing preparation workload. The peer-teaching component further decreases reliance on faculty-led instruction during practice sessions, making the model feasible for programs with limited resources and high student-to-faculty ratios.

6. Recommendations

6.1 Implications for Practice

Nursing curriculum planners and clinical educators may consider adopting the peer-teaching model supported by interactive video preparation as part of clinical skills training. This model can be integrated into pre-lab activities, simulation-based sessions, and interprofessional training modules to enhance learner engagement, confidence, and performance.

Educators can also integrate Edpuzzle-supported peer-teaching activities into clinical preparation courses to strengthen active engagement and build learner confidence prior to simulation or real-world practice.

The findings of this study suggest that the integration of peer teaching with interactive video-based learning can effectively enhance nursing students' self-efficacy and clinical competence with regard to childbirth procedures. Accordingly, it is recommended that:

1. The peer teaching approach be adopted as part of active learning strategies in other clinical practice courses, particularly those involving skill acquisition and critical decision-making. This approach promotes a collaborative learning environment and reduces students' anxiety during skill practice.
2. Academic departments foster communities of practice among faculty members across disciplines to exchange insights and practical experiences gained from the implementation of peer-teaching models, thereby strengthening educational knowledge management at the institutional level.

6.2 Recommendations for Future Research

While this study yielded promising results, several limitations should be acknowledged, including the short duration of the intervention, reliance on self-reported confidence scores, and limited generalizability due to the single-institution sample. To build upon this foundation, future researchers should consider:

1. Exploring the effects of peer teaching on additional variables such as clinical decision-making, problem-solving under pressure, and knowledge transfer to real-world practice.
2. Extending the model to other health science disciplines, including physical therapy, and allied health programs, to examine the adaptability and impact of the approach across diverse contexts.
3. Incorporating mobile applications or digital tools to strengthen peer interaction, provide real-time feedback, and support reflective learning in and beyond the simulation lab.
4. Comparing the peer-teaching model with other collaborative learning techniques such as team-based learning (TBL) or think-pair-share (TPS), to determine the most effective strategies for building confidence and competence in clinical education.
5. Integrating AI-driven chatbots as virtual learning assistants to provide students with real-time feedback, answer procedural questions, and facilitate self-paced learning both during and beyond scheduled sessions.

Although the hybrid peer-teaching model showed immediate improvements in self-efficacy and clinical competence, this study did not assess long-term skill retention or sustained self-confidence after the practicum period. Future research should incorporate longitudinal follow-up to evaluate whether the gains observed in this study continue over time and to confirm the long-term sustainability of the instructional model.

7. Conclusion

This study demonstrated that a peer-teaching instructional model integrating interactive video and simulation effectively enhanced nursing students' self-efficacy, clinical competence, and satisfaction in performing childbirth procedures. The hybrid design offered multiple opportunities for guided practice, peer support, and technology-enhanced preparation, leading to superior learning outcomes compared with conventional instruction. These findings suggest that this model is a practical, scalable, and resource-efficient approach that could be integrated into clinical training courses to strengthen students' readiness before entering real practice. Future applications of this instructional model may expand to other skill-intensive areas in maternal-newborn nursing and contribute to long-term improvements in learner confidence and clinical performance.

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