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Effects of an Entrustable Professional Activities (EPA) based Curriculum on the Teaching Performance of Clinical Nursing Instructors

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ABSTRACT

Background: Traditional time-based nursing training may not ensure clinical competence. Therefore, the competency-based Entrustable Professional Activities (EPAs) teaching model has been introduced to help determine a medical trainee's readiness for independent practice. This study aimed to evaluate the effectiveness of an EPAs measure on clinical instructors and novice nurses. **Methods:** From November 2023 to January 2025, a structured EPA-based curriculum comprising basic training, expert workshops, and lesson plan development was completed by 30 clinical nursing instructors. The Kirkpatrick four-level model was used for evaluation. Data collection included satisfaction surveys, self-assessment questionnaires, and EPAs entrustment level ratings for novice nurses. The trained instructors subsequently applied the EPA framework to supervise 9 novice nurses, generating 108 entrustment assessments across six biweekly evaluation cycles. Statistical analyses included paired-sample t-tests and the Friedman test. **Results:** Participants' satisfaction averaged 4.81 on a 5 point scale. Significant improvements were observed in knowledge, confidence, and teaching skills ($p < 0.001$). Ten EPA-based lesson plans were developed and implemented in clinical practice. Between December 2024 and March2025, 9 novice nurses demonstrated significant improvement in entrustment levels across sixassessment cycles, with a concurrent downward trend in patient safety incidents. **Conclusion:** The EPA-based curriculum enhanced teaching effectiveness, novice nurse competence, and patient safety. This model has potential for broader adoption and future digital integration in nursing education.

Keywords: Clinical Nursing Instructor; Entrustable Professional Activities (EPAs); Kirkpatrick Model; Teaching Performance

INTRODUCTION

Traditional nursing training has predominantly followed a time-based model, wherein progress is gauged by the duration of training and the completion of predetermined tasks. In Taiwan, the early two-year training program for newly recruited nurses exemplified this milestone-based approach. However, such time-oriented models are often limited by rigid scheduling and may fail to ensure that each trainee achieves the clinical competence required for independent practice. These limitations have prompted growing interest in alternative educational strategies that move beyond time-based progression and instead emphasize demonstrated competence as the benchmark for advancement.

Globally, nursing education has increasingly shifted toward competency-based models, with Entrustable Professional Activities (EPAs) emerging as a key framework to operationalize clinical competence. Introduced by Dutch medical education expert Olle ten Cate in 2005, EPAs represent a competency-based educational

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strategy. EPAs emphasize specific clinical tasks as the unit of training and assessment, whereby learners are entrusted with independent execution only after demonstrating sufficient competence (Cate 2005; Willetts & Maguire, 2025). EPAs are grounded in the concept of units of professional practice, encompassing the integration of skills, knowledge, attitudes, and behaviors that collectively constitute clinical competencies (Willetts & Maguire, 2025). By incorporating EPAs into nursing education, curricula can more accurately reflect the contextual demands of clinical practice, aligning educational objectives with the specific execution scenarios encountered in professional settings. This competency-based model provides novice nurses and recent graduates with meaningful, practice-oriented benchmarks that facilitate their transition into the workplace. Operationalized through the longitudinal observation of learners' performance in defined tasks, EPAs enable educators to track the developmental trajectory of competencies and determine the degree to which learners can be entrusted with independent clinical responsibilities. In doing so, EPAs serve as a practical bridge between abstract competency frameworks and actual clinical responsibilities, thereby enhancing both professional accountability and patient safety. Nevertheless, despite the global shift toward competency-based education, there remains a notable gap in the systematic adoption and empirical evaluation of EPA-based curricula in nursing education, particularly in non-Western contexts.

Originally conceptualized in medical education, the EPA model has gradually expanded into the field of nursing. Many scholars both domestically and internationally have recognized EPAs as a critical innovation in nursing education reform. By implementing EPAs, instructors can assess learners' clinical performance more objectively in authentic settings, authorize practice progressively, and build a professional relationship grounded in trust. Recent literature has underscored the utility of EPAs in clarifying educators' teaching responsibilities and students' clinical competency indicators (Alexander *et al*., 2022; Moore *et al*., 2024). EPAs have also been shown to enhance learners' sense of responsibility and readiness for clinical work (Meng *et al*., 2024), and to provide instructors with a structured teaching roadmap (Anthamatten & Pitts, 2024; Sefton *et al*., 2025). In addition, integrated EPA-based training models have emerged to support clinical nursing instructors in making informed entrustment decisions and enhancing patient safety outcomes (Buanz *et al*., 2024; Pietsch *et al*., 2025).

Building on these global insights, the Taiwanese nursing context highlights a critical local need, as current training systems remain largely time-based and clinical instructors face challenges in ensuring consistent competency development. Given the increasing complexity of healthcare environments and the rising demand for patient safety, there is an urgent need for nursing education to shift from time-based paradigms to competency-based approaches. Clinical nursing instructors often face significant challenges in training new staff, including limited teaching time, uneven learning outcomes, and conflicts between clinical and educational roles. The EPA-based rating scale has demonstrated the capacity to differentiate between novice and experienced nurses, serving as a critical reference point for establishing clinical trust in newly graduated or early-career nurses (Hu *et al*., 2025; Jarrett *et al*., 2025).

To respond to these needs, the case institution launched an EPA-based faculty development program for clinical nursing instructors. The program aimed to promote task-based training and improve clinical competence and care quality among novice nurses by equipping instructors with the skills to apply EPAs principles in both teaching and assessment. Therefore, this study aims to address this gap by examining whether an EPA-based curriculum can enhance the teaching performance of clinical nursing instructors and improve the clinical competence of novice nurses in Taiwan.

METHODOLOGY

Study Design

Building on the work of Pereira *et al*. (2025) and Andreou *et al*. (2024), the present study employed a quasi-experimental, single-group pre–post design to evaluate the effectiveness of an EPA-based curriculum for clinical nursing instructors. The program was designed to enhance instructors' teaching performance and, in turn, to strengthen the clinical competence of novice nurses through structured training and the systematic application of Entrustable Professional Activities (EPAs). Both quantitative and qualitative methods were adopted to assess outcomes, including instructor satisfaction, knowledge acquisition, instructional behaviors, and learner performance.

To structure and interpret the program outcomes, the evaluation was guided by Kirkpatrick's four-level model (Kirkpatrick & Kirkpatrick, 2016), which has been widely applied since its inception in 1959 for assessing the effectiveness of training programs (Alsalamah & Callinan, 2022; Han *et al*., 2026). While the quasi-experimental design determined the procedures for data collection and analysis, the Kirkpatrick framework served exclusively as an evaluative lens to categorize the findings across reaction, learning, behavior, and results.

The final analytic sample comprised 30 clinical nursing instructors for the curriculum evaluation and 9 novice nurses for the Level-4 outcome evaluation. Across the follow-up period, 108 EPA-based assessments were completed.

Study Setting

This study was conducted at a regional teaching hospital with a history of nearly 130 years in southern Taiwan between November 2023 and March 2025. As one of the primary hospitals affiliated with the Ministry of Health and Welfare (MOHW), it provides a broad spectrum of medical and nursing services and functions as a training site for both undergraduate and postgraduate nursing students. Its size, patient volume, and responsibility for nurse training make it representative of regional teaching hospitals across Taiwan, though not fully generalized to large medical centers or smaller community hospitals.

Clinical nursing instructors from various departments, including internal medicine, surgery, psychiatry, operating rooms, outpatient clinics, and intensive care units, were recruited for participation. The institution had not previously implemented EPA-based teaching, offering a suitable environment for piloting this competency-based model.

Research Process

To provide a clearer overview of the intervention design, this study developed a structured EPA-based curriculum framework (Figure 1). The framework illustrates the sequential phases of the program, including introductory training, expert engagement, practical application, and implementation in clinical practice. It also demonstrates the alignment between each training phase and the corresponding evaluation levels of the Kirkpatrick model.

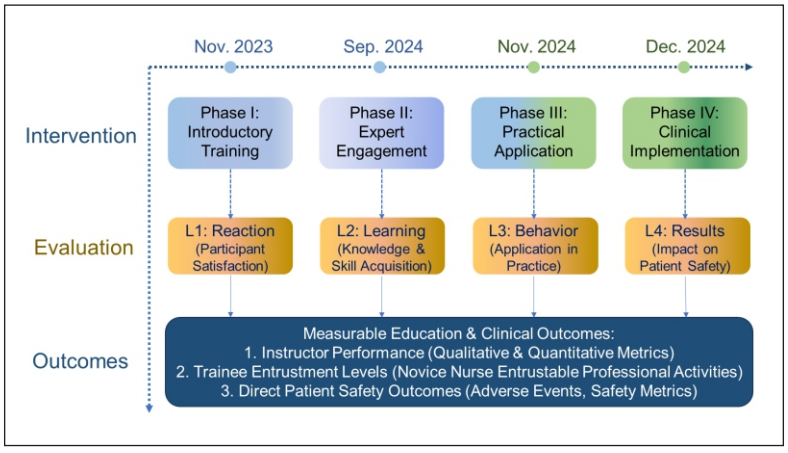

Figure 1: Conceptual Framework of the EPA-Based Curriculum and Evaluation Model

A structured EPA-based faculty development curriculum was designed and implemented in multiple stages:

- **Phase I – Introductory Training** (November 2023): A foundational workshop was held to introduce EPA principles, definitions, and applications to 68 nursing staff.
- **Phase II – Expert Engagement** (September 2024): An expert from National Cheng Kung University

Hospital conducted an advanced session on developing and implementing EPA-based lesson plans, with 48 participants.

- **Phase III – Practical Application Workshop** (November 2024): A hands-on training was held, where 34 participants worked in small groups to design EPA lesson plans through brainstorming, peer feedback, and scenario-based simulations.
- **Phase IV – Tool Refinement and Standardization** (December 2024): Experts supported participants in revising and validating their EPA lesson plans and evaluation forms. A total of 30 instructors completed this stage, resulting in a standardized set of EPA tasks and assessment rubrics suitable for guiding and evaluating novice nurses in clinical practice.

The final EPA toolkit included core clinical tasks relevant to various specialties and was designed to support progressive entrustment decisions in real-world teaching environments. This EPA curriculum was subsequently implemented by the trained instructors with new nursing staff, enabling systematic data collection for evaluation purposes.

Evaluation Tools and Outcome Measures

To align with the program objectives, a series of customized EPA evaluation forms were developed. Each form includes a description of the EPA task, required prerequisite knowledge and skills, and a five-level entrustment rating scale adapted from international EPA frameworks (Cate *et al*., 2015). The scale ranges from Level 1 (requiring direct, full supervision) to Level 5 (able to perform independently and supervise others). All tools underwent expert panel review to ensure content validity.

In addition, two other instruments were used:

- **Satisfaction Survey:** A five-point Likert scale questionnaire (1 = strongly disagree, 5 = strongly agree) was administered at the end of the course to assess participants' satisfaction with course content, teaching effectiveness, and instructional materials.
- **Self-assessment Questionnaire:** Pre- and post-course self-evaluations were conducted to assess instructors' understanding of EPA concepts, confidence in using EPA-based methods, and proficiency in relevant teaching skills such as observation, assessment, and supervision.

In medical education, the Kirkpatrick framework has frequently been applied to evaluate the outcomes of EPA-based teaching and curricular interventions (Bryant *et al*., 2024; Ha *et al*., 2024). While the primary outcome of this study was the teaching performance of clinical nursing instructors, outcomes related to novice nurses and patient safety were included as higher-level indicators (Kirkpatrick Level 4) to evaluate the downstream impact of instructional improvement:

- **Level 1– Reaction:** Participants' satisfaction with the course—including its content, delivery, and perceived relevance—was measured using questionnaires.
- **Level 2– Learning:** Changes in knowledge, confidence, and teaching skills were assessed through pre- and post-course self-assessments. Paired-sample t-tests were used to determine statistical significance.
- **Level 3– Behavior:** Behavioral changes were observed by tracking how instructors applied their EPA lesson plans in real-world clinical teaching. Instructors documented how frequently they used EPA tools, changes in their teaching practices, and perceived impacts on teaching workload.
- **Level 4– Results:** The clinical performance of novice nurses was assessed by tracking entrustment level ratings across six biweekly evaluation cycles. In addition, patient safety incidents (e.g., medication errors, adverse events) were compared before and after EPA implementation to examine downstream effects. From December 2024 to March 2025, 9 novice nurses from 7 nursing units underwent EPA-based supervision, generating 108 assessments over six biweekly cycles.

Data Analysis

All data were collected anonymously and analyzed using SPSS 22.0 software. Descriptive statistics were

used to report participants' demographics, satisfaction scores, and self-assessment results. Pre- and post-intervention scores were compared using paired-sample *t*-tests to assess significant improvements in instructional competence. Friedman tests were applied to examine trends in repeated entrustment level ratings over time for novice nurses. The significance level of $p < 0.05$ was used for all inferential analyses.

Ethical Consideration

The research obtained ethical clearance from the Institutional Review Board (IRB), MOHW Tainan Hospital, Taiwan with approval number 113/D0102, on 25th September, 2024

RESULTS

Participant Demographics and Course Satisfaction

A total of 30 clinical nursing instructors completed the EPA-based curriculum. Participants were drawn from a range of departments including internal medicine, surgery, psychiatry, emergency care, and operating rooms. The majority were female (93.3%), with an average of 14.4 years of nursing experience (SD = 5.4), ranging from 6 to 28 years. Most participants held a bachelor's degree (83.3%) and were classified at N2 competency level or higher (Table 1).

Table 1: Characteristics of Participants (n = 30)

Basic Information	Category	Number of Participants	Percentage (%)
Gender	Male	2	6.7
	Female	28	93.3
Age	25–35 years	5	16.7
	35–45 years	18	60.0
	Above 46 years	7	23.3
Education	Bachelor's degree	25	83.3
	Master's degree	5	16.7
Years of Service	5–10 years	9	30.0
	11–15 years	10	33.3
	16–20 years	6	20.0
	Above 20 years	5	16.7
Position	Head Nurse or above	7	23.3
	Team Leader	1	3.3
	Registered Nurse	22	73.3
Department	Surgical Ward	4	13.3
	Medical Ward	17	56.7
	Psychiatric Ward	3	10.0
	Outpatient	1	3.3
	Emergency Department	1	3.3
	Operating Room	2	6.7
	Intensive Care Unit	2	6.7
Competency Level	N2	22	73.3
	N3	5	16.7
	N4	3	10.0

Level I—Reaction: Course Satisfaction

Satisfaction with the program was high, with a mean score of 4.81 out of 5. All subcategories, including course content relevance, teaching effectiveness, and material clarity, scored above 4.0 (Figure 2). Qualitative feedback revealed that participants particularly appreciated the brainstorming sessions used to co-design EPA lesson plans tailored to clinical needs. Several instructors reported gaining confidence in the application of EPAs despite initial unfamiliarity with the concept and expressed hope to promote the use of EPAs in clinical practice.

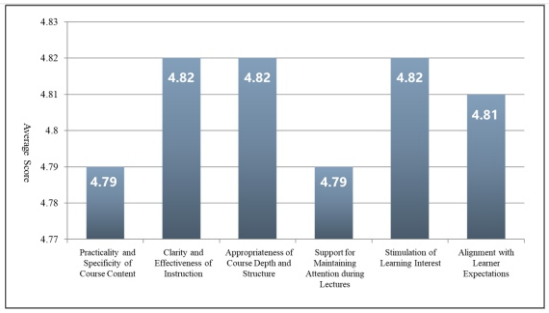

Figure 2: Participants' Course Satisfaction

Level II—Learning: Pre- vs. Post-course Knowledge and Competency Improvements

Thirty-second Pre- and Post-course self-assessment questionnaires were collected and analyzed. Statistically significant improvements were observed in participants' understanding of EPA principles, confidence in using EPAs for clinical instruction, and teaching-related skills (e.g., observation, assessment, and execution).

Following the implementation of the EPA-based curriculum, participants demonstrated statistically significant improvements across all five evaluated dimensions. The average score for "Understanding of EPA concepts" increased from 1.97 (Pre-) to 3.87 (Post-), with a paired-sample t-test yielding $t(29) = -4.6$, $p < 0.001$. Similarly, "Confidence in EPA implementation" rose from 2.13 to 3.87 ($t(29) = -5.5$, $p < 0.001$). The most substantial improvement was observed in "Observation skills", with scores increasing from 2.03 to 4.97 ($t(29) = -5.5$, $p < 0.001$). "Assessment skills" improved from 2.17 to 4.07 ($t(29) = -4.9$, $p < 0.001$), while "Execution skills" rose from 2.00 to 4.00 ($t(29) = -3.9$, $p < 0.001$). (Table 2). All differences reached statistical significance at $p < 0.001$.

Table 2: Paired Sample t-Test Results for Evaluation Dimensions (n = 30)

Evaluation Dimension	Pretest Average Score	Posttest Average Score	Mean Difference (Post – Pre)	*t*-value	*df*	*p*-value
Understanding of EPA concepts	1.97	3.87	↑ 1.90	-4.6	29	0.000
Confidence in EPA implementation	2.13	3.87	↑ 1.74	-5.5	29	0.000
Observation skills	2.03	4.97	↑ 2.94	-5.5	29	0.000
Assessment skills	2.17	4.07	↑ 1.90	-4.9	29	0.000
Execution skills	2.00	4.00	↑ 2.00	-3.9	29	0.000

All p-values are statistically significant at p < 0.001
Note: t-values were calculated based on pretest minus posttest differences, while mean differences are presented as posttest minus pretest for interpretability.

Level III—Behavior: Application of EPA-based Teaching and Entrustment Outcomes

All 30 instructors applied EPA-based lesson plans in clinical practice following completion of the training program.

A total of ten EPA lesson plans were developed and implemented across different clinical settings, including internal medicine, psychiatry, and perioperative care. These lesson plans covered key clinical tasks such as suction techniques, transfusion care, medication administration, restraint use, surgical dressing, and postoperative patient transport.

Level IV—Results: Clinical Performance and Patient Safety of Novice Nurses

Median entrustment scores increased progressively from 2.0 (IQR 2.0–2.0) at Week 2 to 4.1 (IQR 3.0–5.0) at Week 12. Friedman test results indicated a statistically significant improvement ($\chi^2(5) = 42.37$, $p <$

0.001) in entrustment levels across the six assessment points (Table 3). A reduction in patient safety incidents involving novice nurses was observed following the intervention, particularly in medication-related and procedure-related events.

Notably, trends in patient safety outcomes also reflected positive changes. A comparison of adverse events before and after implementation of the program revealed a decline in incidents involving novice nurses during independent practice. Reductions were particularly evident in high-risk domains such as medication safety and invasive procedures. Although the limited sample size precluded rigorous statistical testing, the observed trends suggest that EPA-guided teaching enhanced both the safety awareness and technical competence of novice nurses. Moreover, nurse managers and clinical supervisors reported that EPA assessments enabled early identification of performance issues, allowing for timely corrective interventions and reducing the likelihood of potential errors. Taken together, these findings suggest that the EPA-based training program demonstrated its potential not only to strengthen teaching quality and clinical competence among new nurses, but also to indirectly support patient safety through improved professional performance.

Table 3: Changes in EPA Entrustment Scores Across Six Assessment Cycles (n = 9)

Time Point	Median (IQR)
Week 2	2.0 (2.0–2.0)
Week 4	2.4 (2.0–3.0)
Week 6	2.9 (2.0–3.0)
Week 8	3.3 (3.0–4.0)
Week 10	3.7 (3.0–4.5)
Week 12	4.1 (3.0–5.0)

DISCUSSION

Consistent with recent literature, although the Kirkpatrick model remains a widely adopted framework in nursing and health sciences education, its application in complex clinical environments requires cautious interpretation. In particular, the assumption of a linear progression from learning to behavioral change and patient outcomes has been increasingly challenged (Liu *et al*., 2026). Furthermore, a recent scoping review reported that most studies focus on lower-level outcomes, with limited robust evidence at the behavior and results levels (Gallant *et al*., 2026). This study integrated Entrustable Professional Activities (EPAs) into the routine training of novice nurses, representing a significant pedagogical innovation in Taiwan's clinical nursing education.

Traditionally, nurse training has relied on experiential learning without explicit benchmarks, leaving instructors to estimate readiness based on intuition or accumulated hours. EPA-based training, by contrast, restructures this relationship by introducing explicit entrustable tasks and standardized criteria. This framework reduces ambiguity in performance expectations and enhances instructors' ability to make safe entrustment decisions, which directly links to reductions in patient safety incidents. When learners and instructors share a transparent understanding of competence thresholds, the likelihood of premature delegation—a common contributor to adverse events—is minimized (Lau *et al*., 2020; Sefton *et al*., 2025).

Mechanisms Underpinning Patient Safety Improvements

Feedback from participants in this study echoed the literature, with novice nurses reporting that well-defined learning objectives enhanced their critical thinking, increased instructional flexibility, and facilitated shifts in learning attitudes (Park *et al*., 2023; Nixon *et al.,* 2026). These findings support existing evidence that EPAs effectively bridge competency frameworks and clinical practice (Lau *et al*., 2020; Meng *et al*., 2024). The observed improvements in instructors' teaching performance are consistent with previous studies demonstrating that EPA-based training enhances instructional clarity and assessment accuracy in clinical education. Prior research has shown that EPAs provide structured guidance for clinical teaching and facilitate more objective evaluation of learners' competencies (Anthamatten & Pitts, 2024; Sefton *et al*., 2025). Moreover, EPA-based evaluation tools increased transparency and fairness, decreased the workload

associated with subjective assessment, and enhanced learner motivation through the establishment of clear, measurable goals. This transition from time-based to task-based instruction reflects global trends in competency-based education and carries considerable potential to enhance both patient care quality and the consistency of teaching practices.

The progressive increase in entrustment levels among novice nurses aligns with existing evidence that competency-based approaches support the development of clinical independence and professional confidence (Lau *et al*., 2020; Meng *et al*., 2024). The observed reduction in patient safety incidents is also supported by prior studies suggesting that structured assessment frameworks and clearer supervision criteria can reduce clinical errors and improve patient safety outcomes (Pietsch *et al*., 2025).

Overall, the potential of EPA-based teaching to reduce patient safety incidents can be explained through three interrelated mechanisms. First, the transparency of evaluation criteria enhances accountability: novice nurses are more aware of their performance limits, preventing unsafe overextension in clinical tasks. Second, by focusing on task-specific performance, instructors can identify competence gaps early and provide targeted feedback, thereby preventing minor deficiencies from escalating into clinical errors. Third, EPAs foster a culture of trust and open communication between instructors and learners (Pietsch *et al*., 2025). When learners recognize that their progression is based on objective criteria rather than subjective judgment, they are more likely to seek clarification and support, which further reduces the risk of unsafe practice.

More importantly, unlike many previous studies that focus primarily on learner outcomes, this study extends the literature by examining both instructor-level improvements and downstream clinical outcomes, providing a more comprehensive evaluation of EPA-based educational interventions.

Implementation Challenges

Despite these advantages, several challenges emerged. Initially, instructors and learners expressed concerns about the feasibility and increased workload of EPA adoption, reflecting the tension between standardization and flexibility in clinical education. However, through iterative workshops and peer learning, resistance was gradually replaced by recognition of the fairness and clarity brought by EPA tools. Another challenge concerned the development of valid and reliable EPA instruments. Although this study utilized expert consensus techniques, future research must empirically validate the psychometric properties of EPA tools to ensure consistency across contexts.

Implications and Future Directions

The integration of EPAs into novice nurse training not only enriches the quality of competency-based education but also contributes to the establishment of a trust-based, evidence-driven culture of clinical evaluation. Future work should focus on strategies to enhance scalability, including the development of digital EPA platforms and tiered curriculum templates to reduce instructors' workload and facilitate sustainable implementation (Cotta *et al*., 2024; Andreou *et al*., 2024). By addressing these challenges, EPA-based teaching can further strengthen the alignment between education and clinical practice, ultimately improving patient safety and the professional growth of novice nurses.

Based on our experience, the following strategies are proposed to optimize and expand the implementation of EPA-based nursing education:

- **Digital EPA Platforms:** Transitioning from paper-based to digital platforms would reduce administrative workload, facilitate real-time data capture, and enable cross-departmental data integration for performance tracking and quality improvement.
- **Tiered EPA Competency Frameworks:** While this program focused on early-career nurses, future initiatives could develop EPA frameworks tailored to various levels of clinical seniority, such as

advanced practice nurses or nurse managers, to support lifelong professional development.

- **Simulation and Innovative Teaching Methods:** Integrating simulation-based learning (e.g., standardized patients, VR environments) with EPA tasks would provide low-risk practice opportunities and support active learning beyond the classroom.
- **Cross-Institutional Collaboration:** This program can serve as a pilot model for other institutions. Collaborative efforts, supported by the Ministry of Health or nursing education societies, could facilitate regional EPA resource sharing, reduce duplication of development, and promote national-level standardization.

The findings suggest that the EPA-based curriculum was effective in enhancing instructors' teaching competencies, which in turn contributed to improvements in novice nurses' clinical performance and patient safety outcomes.

Limitations

This study has several limitations. The study used a single-group pre–post design at one regional teaching hospital, which limits causal inference and applicability. The Level-IV evaluation involved only nine novice nurses, and the small sample size limited the ability to evaluate subsequent patient safety outcomes. Although the EPA tools were developed through expert review, formal psychometric testing such as inter-rater reliability and internal consistency was not conducted.

Future Scope

These findings support the use of EPA-based approaches in clinical nursing education and highlight their potential to strengthen competency-based training in real-world healthcare settings. Future multicenter and controlled studies with larger samples are needed to confirm the long-term effectiveness and measurement robustness of EPA-based nursing education.

CONCLUSION

This study demonstrated that an EPA-based curriculum effectively enhanced the teaching performance of clinical nursing instructors. Significant improvements were observed in instructors' knowledge, confidence, and teaching-related skills following the training program. In addition, positive trends were observed in novice nurses' entrustment levels and patient safety outcomes, suggesting potential downstream benefits of improved instructional practices.

CRediT Authorship Contribution Statement

H.F.C: Conceptualization, Methodology, Data analysis, Writing – original draft. J.Y.C: Methodology, Writing – review and editing.

AI Assistance Declaration

AI tools (ChatGPT) were used for language refinement. All content was reviewed and validated by the authors.

Conflict of Interest

The authors declare that they have no competing interests.

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REFERENCES

Alexander, N., Maaz, A., Peters, H., & Kottner, J. (2022). Entrustable professional activities in nursing education: a scoping review protocol. *BMJ Open, 12*(10), e061451. https://doi.org/10.1136/bmjopen-2022-061451

Alsalamah, A., & Callinan, C. (2022). The Kirkpatrick model for training evaluation: bibliometric analysis after 60 years (1959–2020). *Industrial and Commercial Training, 54*(1), 36-63. https://doi.org/10.1108/ICT-12-2020-0115

Andreou, V., Peters, S., Eggermont, J., & Schoenmakers, B. (2024). Co-designing entrustable professional activities in general practitioner's training: a participatory research study. *BMC Medical Education, 24*(1), 549. https://doi.org/10.1186/s12909-024-05530-y

Anthamatten, A., & Pitts, C. (2024). Integration of entrustable professional activities in a Competency-Based clinical assessment tool in a nurse practitioner program. *Nurse Educator, 49*(5), 241-245. https://doi.org/10.1097/NNE.0000000000001697

Bryant, B. H., Anderson, S. R., Brissette, M., Childs, J. M., Gratzinger, D., Johnson, K., Powell, D. E., Zein-Eldin Powell, S., Timmons, C. F., Chute, D., Cummings, T. J., Furlong, M. A., Hébert, T. M., Reeves, H. M., Rush, D., Vitkovski, T., & McCloskey, C. B. (2024). National pilot of entrustable professional activities in pathology residency training. *Academic Pathology, 11*(2), 100110. https://doi.org/10.1016/j.acpath.2024.100110

Buanz, S. F., Alsenayien, A. Y., Altharman, H. A., Alnaqi, R. I., Llaguno, M. B. B., Mousa, O., & Siraj, R. A. (2024). Nursing students, faculty, and preceptors perception of effective characteristics of clinical instructor: A cross-sectional study. *SAGE Open Nursing, 10*, 23779608241298427. https://doi.org/10.1177/23779608241298427

Cate, O. T., (2005). Entrustability of professional activities and competency-based training. *Medical Education, 39*(12), 1176-1177. https://doi.org/10.1111/j.1365-2929.2005.02341.x

Cate, O. T., Chen, H. C., Hoff, R. G., Peters, H., Bok, H., & van der Schaaf, M. (2015). Curriculum development for the workplace using entrustable professional activities (EPAs): AMEE guide no. 99. *Medical Teacher, 37*(11), 983-1002. https://doi.org/10.3109/0142159X.2015.1060308

Cotta, R. M. M., de Souza Ferreira, E., de Aguiar Franco, F., da Costa Souza Barros, G., Januário, J. P. T., Moreira, T. R., & Martín, R. L. (2024). The effectiveness of faculty development programs for training university professors in the health area: a systematic review and meta-analysis. *BMC Medical Education, 24*(1), 768. https://doi.org/10.1186/s12909-024-05735-1

Gallant, N. L., Oddone Paolucci, E., Russill, C. L., Jewett, R., Recsky, C., Ford, K., Idriss-Wheeler, D., Tseung, V., Ansari, H., Ladak, Z., Fernandes, A., & Marshall, D. A. (2026). Applications of the Kirkpatrick Model in Post-secondary Health Sciences Education: A Scoping Review. *International Journal of Health Policy and Management, 15*, e8857. https://doi.org/10.34172/ijhpm.8857

Ha, E. L., Glaeser, A. M., Wilhalme, H., & Braddock, C. (2024). Assessing readiness: The impact of an experiential learning entrustable professional activity-based residency preparatory course. *Medical Education Online, 29*(1). e2352217. https://doi.org/10.1080/10872981.2024.2352217

Han, S., Dong, W., Duan, X., Chen, F., Cao, G., Zhu, R., & Zhang, Q. (2026). Developing an Evaluation Framework Based on Entrustable Professional Activities for Advanced Practice Nurses in China. *International Nursing Review, 73*(1), e70151. https://doi.org/10.1111/inr.70151

Hu, S. H.-L., Tsay, S.-L., Huang, S.-S., Tung, H.-H., Chen, Y.-R., Lu, L.-C., Chang, C., Hu, J.-Y., & Hung, W.-C. (2025). Development and Validation of an Entrustable Professional Activity-Based Assessment Scale for Nurse Practitioners in Taiwan. *Journal of Nursing Research, 33*(4), e399. https://doi.org/10.1097/jnr.0000000000000682

Jarrett, J. B., Elmes-Patel, A. T., Allen, S. M., Djuric Kachlic, M., Schriever, A. E., Driscoll, T. P., ... & Schwartz, A. (2025). Longitudinal preceptor assessment of entrustable professional activities across Introductory and Advanced Pharmacy Practice Experiences. *Pharmacy, 13*(3), 72. https://doi.org/10.3390/pharmacy13030072

Kirkpatrick, J. D., & Kirkpatrick, W. K. (2016). *Kirkpatrick's four levels of training evaluation*. Association for Talent Development.

Lau, S. T., Ang, E., Samarasekera, D. D., & Shorey, S. (2020). Evaluation of an undergraduate nursing entrustable professional activities framework: An exploratory qualitative research. *Nurse Education Today, 87*, 104343. https://doi.org/10.1016/j.nedt.2020.104343

Liu, W. L., Chen, L., Zhang, L., Yang, L., & Fu, M. Y. (2026). Reframing the Kirkpatrick Model for Evaluating Humanistic Care Training in Nursing: A Context-Sensitive Integrative Perspective. *Frontiers in Public Health, 14*, 1789683. https://doi.org/10.3389/fpubh.2026.1789683

Meng, Z., Haidan, C., Junye, T., Qian, L., Xin, Q., & Cheng, W. (2024). Development of entrustable professional activities for novice nurses: A modified Delphi study. *Nurse Education in Practice, 81*, 104181. https://doi.org/10.1016/j.nepr.2024.104181

Moore, J., Chan, T., Doucette, J., Lipps, T., & Slager, D. (2024). Defining nurse practitioner core entrustable professional activities: essential step toward competency-based education. *Nurse Educator, 49*(5), 235-240. https://doi.org/10.1097/NNE.0000000000001673

Nixon, L. J., Poeppelman, R. S., Traxler, M., & Violato, C. (2026). Assessing core entrustable professional activities in the pre-clerkship phase of undergraduate medical education. *Academic Medicine*, wvag059. https://doi.org/10.1093/acamed/wvag059

Park, S., Chiang, N. J., Nyhof-Young, J., Rojas, D., Lazor, J., & Sirianni, G. (2023). Entrustable professional activities in undergraduate medical education: A needs assessment of medical students and faculty. *Education in the Health Professions, 6*(2), 92-95. https://doi.org/10.4103/EHP.EHP_3_23

Pereira, F., Lehmann-Wellig, B., & Verloo, H. (2025). Enhancing beliefs and implementation of evidence-based practice among undergraduate nurses using a multi-component educational programme: a pre–post study. *BMC Medical Education, 25*(1), 531. https://doi.org/10.1186/s12909-025-07121-x

Pietsch, J., Maaz, A., & Kottner, J. (2025). Entrustable professional activities in nursing education: a scoping review. *BMJ Open, 15*(5), e094609. https://doi.org/10.1136/bmjopen-2024-094609

Sefton, K., Harder, N., & Kramer, M. (2025). Mentorship outcomes for clinical nursing instructors: A scoping review. *Teaching and Learning in Nursing, 20*(3), 261-267. https://doi.org/10.1016/j.teln.2025.02.021

Willetts, G., & Maguire, T. (2025). The Natural Progression for Nursing Practice:" Competency-Based Frameworks" to" Entrustable Professional Activities". *Nursing & Health Sciences, 27*(1). https://doi.org/10.1111/nhs.70065