

# The Development of a Program to Enhance the Reflective Competency of Nurse Educators to Promote the Cognitive Skills of Nursing Students

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**Abstract:** This research and development study aims to: (1) develop a program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students; and (2) to evaluate the effectiveness of the program for enhancing the reflective competency of nurse educators. The sample included 48 nurse educators of Boromarajonani College of Nursing in Chonburi and 260 nursing students were purposively selected. The instruments used for collecting data consisted of the following: (1) a reflective competency questionnaire for nurse educators; and (2) a questionnaire assessing cognitive skills of nursing students. The data were analyzed using mean, standard deviation, and a paired simple t-test. The results found that the developed program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students composed of three learning units, including the following: (1) basic knowledge about reflection; (2) application of reflection on teaching and learning management; and (3) the lessons learned after the implementation of reflection. The evaluation of the effectiveness of the program found that the mean scores of knowledge about reflection, attitudes to reflection, and the reflective skills of nurse educators after implementation of the program for enhancing the reflective competency of nurse educators were statistically higher than those before implementation, and the mean scores on systematic thinking, critical thinking, and clinical judgement among nursing students after the application of reflection on teaching and learning management by trained nurse educators were statistically higher than before implementation. In conclusion, the developed program for enhancing the reflective competency of nurse educators was effective to promote the cognitive skills of nursing students, leading to qualified nursing practice.

**Keywords:** Cognitive skills, Nurse educators; Nursing students, Program development, Reflective competency

## Introduction

Cognitive skills are brain-based skills which are needed for the acquisition of knowledge, the manipulation of information and reasoning (Kiely and Kim, 2014). The Ministry of Education of Thailand proposed the Thai Qualification Framework for Higher Education (TQF: HEd) to determine the quality of Thai graduates through five domains of standard learning outcomes, including ethics, knowledge, cognitive skills, interpersonal skills and responsibility, as well as numerical analysis communication and technological skills (Office of the Higher Education Commission, 2015). The systematic thinking, critical thinking and clinical judgement were considered as crucial cognitive skills for the nursing profession. Critical thinking is applied by nurses in the process of solving the problems of patients, and is an essential process for a safe, efficient and skillful nursing intervention (Papathanasiou, Kleisiaris, Fradelos, Kakou, and Kourkouta, 2014). Clinical judgement in nursing was defined as the cognitive process exhibited via a nursing action by observation, patient assessment, interpretation, and prioritizing the data that lead to responding, using the appropriate nursing practice with patients (Uppor, Klunklin, Viseskul and Skulphan, 2022). Clinical judgement is an important element of the decision-making process of nurses that affects patient safety. Lee and Wessol (2021) explored the relationships between clinical judgement skills, reasoning processes and safe medication practices among senior nursing students, and found a positive relationship between clinical judgement skills and safe medication practices.

Nursing education has been challenged to cultivate cognitive skills for future nurses. Future nurses need to be able to cognitively integrate various forms of content and skills to

care for patients in their clinical practice (Ignacio and Chen, 2020). Several educational strategies have been implemented to promote the cognitive skills of nursing students and reflection has been approved to be effective to improve critical thinking and clinical judgement. Tano and Wisanskoonwong (2020) examined the effectiveness of learning through reflective thinking on the metacognition of nursing students in the delivery room, and found that learning through reflective thinking using Gibb's model was effective to improve metacognition among nursing students. Gibb's reflective cycle was also applied to be a teaching strategy in four weeks of clinical practice for third-year nursing students, and that a critical thinking post-test score among nursing students were significantly higher than a pre-test score, as well as those in a control group (Khorphon, Pankeaw, Sarobol, Choopun, Chomchan, and Boonlue, 2019).

Nurse educators play an important role as a cognitive coach to cultivate the cognitive skills of nursing students. In order to encourage nursing students doing reflective practice, nurse educators are required to be present and reflective while directly involved in nursing students in teaching and learning, using creative and innovative interaction (Froneman, Plessis and Catherina van Graan, 2022). Nurse educators should be role models in terms of reflection for their students. Nursing education institutes need to encourage their nurse educators to have reflective competency in order to promote the cognitive skills of their students. Based on a review of the literature, there were limited studies on program development for nurse educators. A formulation of a teacher development program to promote integrative learning, systematic thinking, and humanitarian volunteerism in a multicultural society developed by Charoensuk, Phetkong, and Choolert (2015) and found to be effective to encourage nurse educators and applied integrative learning to promote systematic thinking, and humanitarian volunteerism in a multicultural society skills of nursing students. Boonvas, Khumtorn and Suppasri (2017) developed a reflective learning practice program for nurse lecturers, and found that the program was effective to improve knowledge, attitudes and practice toward reflective learning practice. However, the real practice of nurse lecturers, and implication to nursing students were not examined. Therefore, we are interested in a development of program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students. This program would be beneficial for nurse educators to improve their teaching and learning methods using reflection that led to produce qualified future nurses. The objectives of this research were as follows: (1) to develop a program for enhancing the reflective competencies of nurse educators in order to promote the cognitive skills of nursing students; (2) to evaluate an effectiveness of the developed program for enhancing the reflective competency of nurse educators and promoting the cognitive skills of nursing students. The research hypotheses were as follows: (1) the nurse educators who participated in the program would report a higher score of knowledge, attitude and skills of reflection after training in the program; and (2) the nursing students who take courses that the trained nurse educators applied reflective strategies in the course reported a higher score of cognitive skills after taking the courses. In addition, this study was approved from the Institutional Review Board on Research Involving Human Subjects of the Boromarajonani College of Nursing, Chonburi, with No.4/2563 on March 2, 2020. The researchers explained the purposes of the study and process of collecting data to all participants. The data will be anonymous with no personal identifier and presented as a group, rather than individuals. The participants had a right to refuse to answer questions and withdraw from the study at any time. If they were willing to participate, they completed the questionnaire.

## Research Framework

The research framework for the development of program for enhancing the reflective competency of nurse educators in order to promote cognitive skills among nursing students.

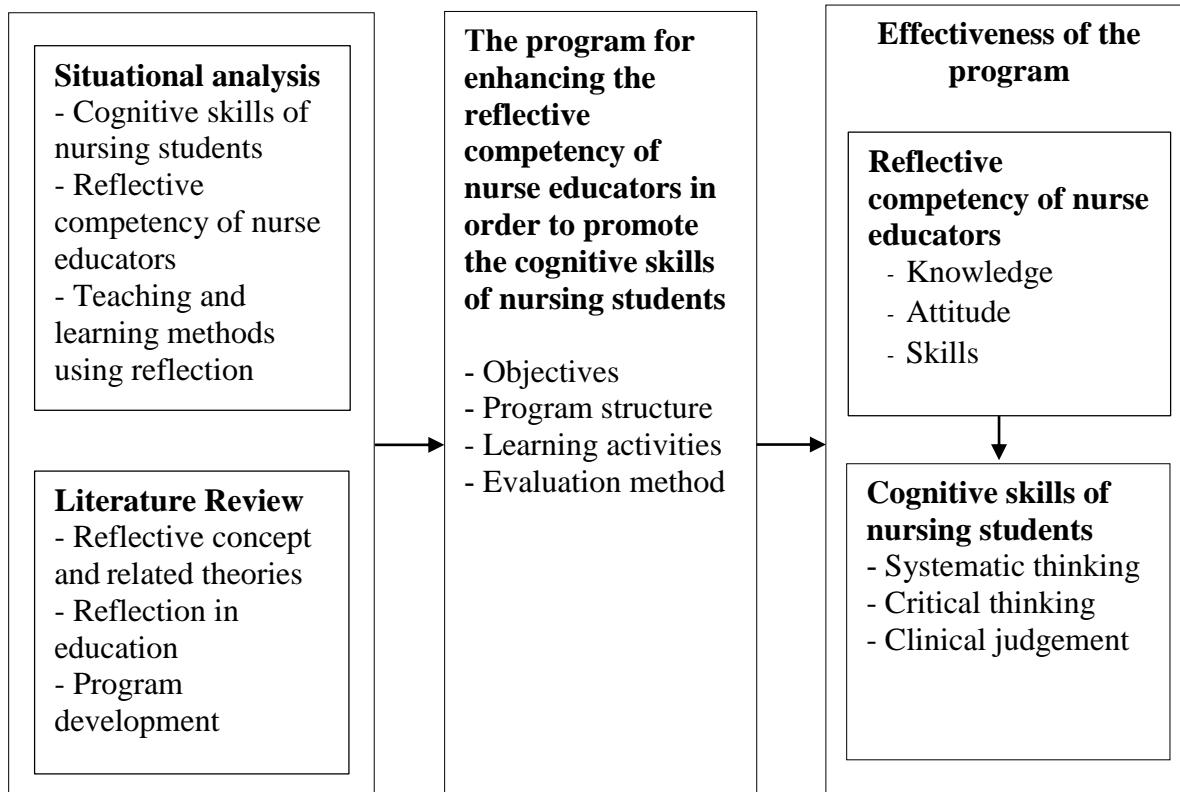


Figure 1 Research Framework

## Research methodology

The study of the development of a program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students was conducted in four phases, as follows:

### *Phase 1: Situational Analysis*

The study in Phase One consists of the following three steps:

1.1 Evaluation of the cognitive skills of nursing students. The sample included 260 nursing students in the Bachelor of Nursing Science Program at Boromarajonani College of Nursing, Chonburi in the 2019 academic year. The study was conducted in March 2020. The data collection tool was a questionnaire assessing the cognitive skills of nursing students that consisted of four parts, including the following:

(1) The demographic data was collected on a questionnaire asking two general questions. The questionnaire consisted of a fill-in-the-blanks about educational level and GPA.

(2) Systems Thinking Scale developed by Charoensuk, et. al. (2015) was used to assess the systematic thinking of nursing students. It consisted of 20 questions

based on a five-point Likert Scale. The systems thinking was classified into five levels, highest ( $M=4.21-5.00$ ); high ( $M=3.41-4.20$ ); moderate ( $M=2.61-3.40$ ); low ( $M=1.81-2.60$ ); and lowest ( $M=1.00-1.80$ ). The validity value came from Index of Item-Objective Congruence (IOC) between 0.8-1.00 and the reliability measured by the Cronbach's alpha coefficient was 0.80.

(1) The critical thinking questionnaire developed by Petchoo (2013) was used to assess the critical thinking skills of nursing students. It consisted of 22 questions based on the five-point Likert Scale. Critical thinking was classified into five levels; the highest (4.50-5.00); high (3.50-4.49); moderate (2.50-3.49); low (1.50-2.49); and lowest (1.00-1.49). The validity value came from Index of Item-Objective Congruence (IOC) between 0.6-1.00 and the reliability was measured by the Cronbach's alpha coefficient was 0.97.

(2) The clinical judgement test was developed by Sinthuchi, et. al. (2018) and used to assess the clinical judgement of nursing students. It was a modified essay question (MEQ) that used a simulation to measure clinical judgement abilities of nursing students with 23 questions. The clinical judgement was classified into three levels, high (24-30); moderate (18-23); and low (0-17). The item analysis of the clinical judgement test had a difficulty index (p) between 0.34–0.58 and discriminant index (r) between 0.22–0.66. The validity value came from the Index of Item-Objective Congruence (IOC) between 0.7-1.00 and the reliability measured by Kuder-Richardson's KR-20 formula was 0.71.

1.2 An evaluation of the reflective competency of nurse educators. The sample included 48 nurse educators of the Boromarajonani College of Nursing, Chonburi taught in the 2019 academic year, who were purposively selected. The data were collected in April 2020. The data collection tool was a reflective competency questionnaire for nurse educators that consisted of four parts, including:

(1) the demographic data was a questionnaire asking four general questions. The questionnaire consists of a fill-in-the-blanks about the ages of the respondents and teaching experience, and multiple-choice questions about training on reflective thinking and the application of reflective thinking into teaching.

(2) knowledge about reflection was assessed using a test developed by Boonvas, et.al. (2017). It consisted of 20 questions with two choices (true or false) as nurse educators received one score for one correct answer and no score for wrong answers. The knowledge about reflection was classified into three levels, high (16-20); moderate (12-15); and low (0-11). The validity value came from the Index of Item-Objective Congruence (IOC) between 0.8-1.00 and reliability measured by Kuder-Richardson's KR-20 formula was 0.85.

(3) Attitudes toward the reflection questionnaire developed by Boonvas, et.al. (2017) was used to assess attitudes toward the reflection of nurse educators. It consisted of 20 questions based on the four-point Likert Scale. The attitudes toward reflection were classified into three levels: high (16-20); moderate (12-15); and low (0-11). The validity value came from Index of Item-Objective Congruence (IOC) between 0.8-1.00, and the reliability measured by a Cronbach's alpha coefficient of 0.83.

(4) A reflective skill questionnaire developed by the researcher based on Gibbs' theory (Gibbs, 1988, cited in Amanda, 2017). It consisted of 20 questions based on a five-point Likert Scale. The reflective skill was classified into three levels, high (3.66-5.00); moderate (2.33-3.65); and low (1.00-2.32). The validity value came from the Index of Item-Objective Congruence (IOC) between 0.8-1.00, and the reliability measured by the Cronbach's alpha coefficient of 0.93.

1.3 The situation of teaching and learning methods using reflection. The researchers reviewed the syllabus of nursing courses in the 2019 academic year to examine how nurse educators applied reflection as a teaching strategy. It was found that only seven

nursing courses mentioned reflection. Most of these courses used reflective writing as an evaluation method. However, they did not mention a particular model of reflection.

*Phase 2: Drafting and validating the program for enhancing the reflective competency of nurse educators in order to promote cognitive skills of nursing students*

The study in Phase Two consisted of two steps:

2.1 The researchers reviewed literature about reflective concept and related theories, reflection in education and program development as a guideline for drafting the specification of program that composed of three learning units. The learning units, including: (1) basic knowledge of reflection; (2) application of reflection on teaching and learning management; and (3) the lessons learned after the implementation of reflection.

2.2 The quality of the program was examined by three experts in curriculum development. The Content Validity Index (CVI) of 1 was obtained after small revision following the opinions of experts.

*Phase 3: Implementation of the developed program*

The developed program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students was implemented in the 2020 academic year. It was divided into three steps, following the learning units.

3.1 The first learning unit: basic knowledge about reflection. The first learning unit aimed to provide basic knowledge about reflection, encourage nurse educators to recognize the importance of reflection, and motivate them to design their teaching strategy using reflection. The researchers organized a two-day workshop using several activities, including lectures, group discussions, practice, and sharing experiences. All 48 nurse educators in the 2020 academic year were asked to participate in the workshop on 9-10 June, 2020. The program structure was composed of Basic Foundation of Reflection, Models of Reflective Thinking, Reflective Writing, Coaching: The Significant Role of Educators, and Reflections on Learning.

3.2 The second learning unit: the application of reflection on teaching and learning management. The second learning unit aimed to promote an application of reflection on teaching and learning management, to monitor the process of application, and to evaluate the results of learning outcomes of courses. The activities in these learning units included designing the course using a reflective strategy, implementing the course, and evaluating the learning outcomes of the course using reflection. The nurse educators who completed the first learning unit were asked to design their teaching and learning methods using reflection in the course that they were course coordinators. In this study there were 14 nursing courses that nurse educators applied reflection into the courses, including the following: (1) Principles and Techniques in Nursing Practicum; (2) Adult Nursing and Gerontological Nursing; (3) Adult Nursing and Gerontological Nursing Practicum; (4) Children and Adolescent Nursing; (5) Children and Adolescent Nursing Practicum Two; (6) Community Nursing One; (7) Community Nursing Practicum One; (8) Basic Medical Treatment Practicum; (9) Mental Health and Psychiatric Nursing; (10) Mental Health and Psychiatric Nursing Practicum; (11) Maternal and Newborn Nursing and Midwifery One; (12) Maternal and Newborn Nursing and Midwifery Practicum One; (13) Maternal and Newborn Nursing and Midwifery Two; and (14) Maternal and Newborn Nursing and Midwifery Practicum One.

3.3 The third learning unit: the lessons learned after the implementation of reflection. The last learning unit aimed to encourage nurse educators to apply reflection as their teaching strategy, summarize challenges in the application of reflection, and propose a

policy to support the application of reflection. The researchers organized a two-day workshop using several activities, including presentation, group discussion, practice, and sharing experiences. All 48 nurse educators in the 2020 academic year were asked to participate in a workshop on 19-20 April 2021. The program structure consisted of Applications of Reflection in Nursing Courses, Reflective Writing, and Reflections on Learning.

#### *Phase 4: Evaluation of the Effectiveness of the Program*

The researchers evaluated the effectiveness of program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of the nursing students in two steps:

4.1 The evaluation of reflective competency of nurse educators. The same group of 48 nurse educators were asked to complete the reflective competency questionnaire after completing the last learning unit. The same reflective competency questionnaire was employed after the nurse educators shared their experiences about the application of reflective thinking into their teaching on 20 April 2021.

4.2 The evaluation of the cognitive skills of nursing students. The same group of 216 nursing students were asked to complete the same tool of assessing cognitive skills, including systematic thinking, critical thinking, and clinical judgement skills at the end of the 2020 academic year in May 2021.

#### *Data analysis*

The data were analyzed and obtained from the study as follows:

1. To analyze the reflective competency of nurse educators and cognitive skills of nursing students by calculating mean ( $\bar{x}$ ) and standard deviation (SD).

3. To analyze a comparison of the reflective competency of nurse educators, which consisted of knowledge about reflection, attitudes to reflection and reflective skills before and after implementing the program for enhancing reflective competency of nurse educators in order to promote cognitive skills of nursing students by paired sample t-test statistics.

4. Analyze a comparison of the cognitive skills of nursing students, which consisted of systematic thinking, critical thinking, and clinical judgement before and after taking courses that nurse educators applied reflection into the courses by paired sample t-test statistics.

## **Research Results**

1. *A development of a program to enhance the reflective competency of nurse educators in order to promote the cognitive skills of nursing students.*

The results of study found that the developed program on reflective competency for enhancing nurse educators in order to promote cognitive skills of nursing students composed of three learning units, including the following:

*Learning Unit 1:* Basic knowledge about reflection. The objectives of the first learning unit were to provide basic knowledge about reflection, to encourage nurse educators to recognize the importance of reflection, and to motivate nurse educators to design their teaching strategy using reflection. The learning activities included lectures, group discussions, practice, and sharing experiences. The program structure was composed of mindfulness and self-understanding, concepts and reflective models, reflective writing, the

role of nurse educators in teaching and learning methods using reflection, and the preparation action plans of applying reflection in teaching and learning. The evaluation of learning focused on participation in these activities.

*Learning unit 2:* Application of reflection on teaching and learning management. The objectives of the second learning units were to promote an application of reflection on teaching and learning management, to monitor the process of application, and evaluate the results of the learning outcomes of courses. The activities in this learning units included designing the course using reflective strategy, implementing the course, and evaluating the learning outcomes of the course using reflection. The program structure was composed of course descriptions of all courses that applied reflection. The evaluation of learning focused on the applications of reflection.

*Learning unit 3:* The lessons learned after the implementation of reflection. The objectives of the last learning units were to encourage nurse educators to apply reflection as their teaching strategy, to summarize challenges in the application of reflection, and to propose a policy to support the application of reflection. The activities included presentation, group discussion, practice, and shared experiences. The program structure was composed of applications of reflection in nursing courses, reflection on learning, challenges and the way forward. The evaluation of learning focused on lesson learned from reflection.

## *2. An effectiveness of a developed program for enhancing the reflective competency about nurse educators in order to promote the cognitive skills of nursing students*

2.1 The reflective competency of nurse educators included knowledge about reflection, attitudes toward reflection, and reflective skills before and after implementing a program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students were shown in Table 1 and 2.

Table 1 The mean and standard deviation of the reflective competency of nurse educators before and after implementing a program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students. (n=48)

Reflective Competency of Nurse Educators	Before implementing the program			After implementing program		
	M	SD	Level	M	S.D.	Level
Knowledge about reflection	17.13	1.85	High	17.73	1.50	High
Attitudes toward reflection	3.24	0.26	High	3.35	0.26	High
Reflective skills	4.17	0.54	High	4.35	0.49	High

In Table 1, it was found that nursing educators had a mean score of knowledge about reflection, attitudes toward reflection and reflective skills at a high level both before and after implementing the program for enhancing the reflective competency of nurse educators in order to promote cognitive skills of nursing students.

Table 2 A mean comparison of the reflective competency of nurse educators before and after implementing a program for enhancing the reflective competency of nurse educators in order to promote cognitive skills of nursing students. (n=48)

Reflective Competency of Nurse Educators	M	SD	$\bar{d}$	$S.D_{\bar{d}}$	t	p-value
Knowledge about reflection						
Before	17.13	1.85				
After	17.73	1.50	0.60	1.91	2.19	.033*
Attitude toward reflection						
Before	3.24	0.26				
After	3.35	0.26	0.12	0.29	2.58	.013*
Reflective skill						
Before	4.17	0.54				
After	4.35	0.49	0.18	0.56	2.23	.031*

\*Statistical significance level of .05

In Table 2, the mean score of knowledge about reflection, attitude toward reflection and reflective skill after implementing program for enhancing the reflective competency of nurse educators in order to promote cognitive skills of nursing students were statistical significantly higher than those before implementation.

2.2 The cognitive skills of nursing students, including systematic thinking, critical thinking, and clinical judgement before and after taking courses that nurse educators applied reflection into the courses shown in Table 3 and Table 4.

Table 3 The mean and standard deviation of cognitive skills of nursing students before and after taking courses that nurse educators applied reflection into courses (n=260)

Cognitive Skills of Nursing Students	Before taking the courses			After taking the courses		
	M	S.D.	Level	M	S.D.	Level
Systematic thinking	3.53	0.33	High	3.92	0.47	High
Critical thinking	3.53	0.54	High	3.93	0.49	High
Clinical judgement	7.49	3.17	Low	10.18	3.36	Low

In Table 3, it was found that the cognitive skills of the nursing students, including systematic thinking and critical thinking were at high levels both before and after taking the courses, but mean score of clinical judgement were at low levels both before and after taking the courses.

Table 4 A mean comparison of the cognitive skills of nursing students before and after taking the courses that nurse educators applied reflection into the courses (n=260)

Cognitive Skills of Nursing Students	M	SD	$\bar{d}$	$S.D_{\bar{d}}$	t	p-value
Systematic thinking						
Before	3.53	0.33				
After	3.92	0.47	0.40	0.41	11.86	.000*
Critical thinking						
Before	3.53	0.54				
After	3.93	0.49	0.39	0.76	6.42	.000*
Clinical judgement						
Before	7.49	3.17				
After	10.18	3.36	2.69	2.23	14.91	.000*

\*Statistical significance level of .001

In Table 4, the mean score of systematic thinking, critical thinking, and clinical judgement of nursing students after taking the courses that nurse educators applied reflection into the courses were higher at a statistically significant level than before taking the courses.

## Discussion

### *(1) The development of a program to enhance the reflective competency of nurse educators in order to promote the cognitive skills of nursing students.*

The program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students composed of three learning units, including the following: (1) basic knowledge on reflection; (2) application of reflection on teaching and learning management; and (3) the lessons learned after the implementation of reflection. The program was developed based on Kolb's experiential learning theory and reflective concepts since Kolb's theory emphasized reflection firmly in experience-based learning (Kolb, 1984, cited in Amanda, 2017). Therefore, the program structure focused on knowledge, but also application and reflection after implementation. The nurse educators were trained in the two-day workshop for gaining basic knowledge about reflection. They were asked to think critically on how to apply what they learned in courses at the end of the first workshop. The second unit of learning was an application of reflection on teaching and learning management, the nurse educators applied reflective teaching method on their courses for both theoretical and practical courses. This allowed nurse educators to perform concrete experience, and practiced critical reflective skills with nursing students. The nurse educators who applied reflective teaching method on their courses were invited to participate in the third unit of program at the end of the academic year by reflecting on their experiences and sharing with colleagues. The process of reflection was that nurse educators contemplated their approaches to teaching and strategized the desired learning outcomes for student success is critical as they educate future generations of nurses (Green, 2023).

(2) the effectiveness of the developed program for enhancing the reflective competency of nurse educators in order to promote cognitive skills of nursing students. The developed program was effective in enhancing the reflective competency of nurse educators. The mean scores of the nurse educators in terms of reflection on knowledge, attitude and skills increased after the program implementation. The reasons are not only based on Bloom's taxonomy, but also Kolb's experiential learning concepts. The nurse educators were

trained to identify basic knowledge of reflection, applied the knowledge into their teaching practice, and reflected on their practice as lessons learned. The nurse educators learned from their experience by reflection on experiences. Schwind and Manankil-Rankin (2020) proposed that deliberate reflections on experiences gave meaning to our ways of being (ontology), knowing (epistemology), and doing (praxis).

The developed program was also effective to promote cognitive skills of nursing students in the courses that the trained nurse educators applied reflective teaching for student learning. In this study, nurse educators applied reflective teaching into 14 nursing courses. Reflective writing was one of the course requirements. The students also reflected daily with the nurse educators during their practice (reflection in action) and after their practice (reflection on action). The mean scores of the cognitive skills of nursing students, including systematic thinking, critical thinking, and clinical judgement were higher than those before taking the courses. The results of this study were congruent with several studies using the reflective thinking process to improve cognitive skills of nursing students (Khorphon, et. al., 2019; Pinjai, Promphao and Chirinkom, 2019; Tano, and Wisanskoonwong, 2020). Reflection is an important learning strategy for both theoretical and clinical courses in nursing education. Reflection leads students to reflect on themselves in all aspects, including thinking, feeling, and action. Reflective practice is a cognitive skill that demands a conscious effort to look at situations with an awareness of own beliefs, values, and practice enabling nurses to learn from experiences, and incorporated learning in improving patient care outcomes (Patel and Metersky, 2022).

## Conclusion

The program for enhancing the reflective competency of nurse educators in order to promote the cognitive skills of nursing students was effective to enhance the reflective competency of nurse educators, and to promote the cognitive skills of nursing students. The program was developed based on Kolb's experiential learning theory and reflective concepts composed of three learning units, including the following: (1) basic knowledge on reflection; (2) application of reflection on teaching and learning management; and (3) the lesson learned after the implementation of reflection.

### *Recommendations for implications*

1. The program could be applied for enhance the reflective competency of nurse educators in order to promote the cognitive skills of nursing students. However, reflective practice is dynamic, and its effectiveness and application depended on the context.

2. The program could adapt the content to fit with learning context in the first unit, but the second and third units are significant processes need to be performed.

### *Recommendations for future research*

1. The results of this study could be a basic foundation of further study in a development of program for enhancing the other competencies of nurse educators, such as coaching and digitalizing.

2. The clinical judgement is a cognitive skills of nursing students may need more investigation since it had the least improvement. There might be other influenced factors, such as the environment in clinical setting and roles of nurse educators in the implementation of reflective teaching.

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