

Development of Learning Management Model Through Participative Reflection to Enhance Critical Thinking of Nursing Students

Supattra Chansuvarn¹ Wannee Niamhom^{2*} Sunti Srisuantang³

¹ Doctoral Program in Human and Community Resource Development, Faculty of Education and Development Sciences, Kasetsart University, Nakhon Pathom, Thailand 73140

²⁻³Faculty of Education and Development Sciences, Kasetsart University, Nakhon Pathom, Thailand 73140

*Corresponding author e-mail: feduvna@ku.ac.th

Received: September 11, 2024

Revised: October 21, 2024

Accepted: November 10, 2024

Abstract: The research aimed to develop a reflective learning model to enhance nursing students' critical thinking skills. The goals were to create the model, evaluate its effectiveness, and monitor the transfer of reflective learning. The study had four phases: identifying problems in reflective learning, developing the model, evaluating its effectiveness, and transferring the learning. The sample group consisted of experts in the field of nursing reflection, teachers responsible for the nursing curriculum, and nursing students. The tools used to collect data were: 1) a questionnaire on current problems regarding students' critical thinking abilities; 2) an assessment of critical thinking ability; 3) an assessment of reflective behavior; and 4) an assessment of satisfaction with learning management. We analyzed the data using mean, standard deviation, T-test, and content analysis. Results: 1. The results revealed that nursing students had problems with critical thinking at a moderate level ($M = 3.48$, standard deviation = 0.56); as a result, reflective learning should be integrated into the curriculum to enable nursing students to think critically. 2. The development of reflective learning model consisted of five steps: 1) activity preparation; 2) introduction; 3) virtual simulation activity implementation; 4) reflection and learning summary; and 5) evaluation. 3. After the implementation of the model, the nursing students demonstrated discrepancy in critical thinking skills before and after the experiment significantly at the 0.05. 4. The results of the follow-up on the transfer of the reflective learning revealed three key issues: 1) applying the knowledge to patients in real-life situations; 2) solving real problems; and 3) gaining confidence in providing quality patient care. Conclusion: Managing learning through reflection encouraged nursing students to think critically and solve problems in nursing practice.

Keywords: Critical thinking, Learning management model, Nursing students, Participative, Reflective learning

Introduction

The onset of the 21st century marked a period of rapid change, volatility, and ambiguity in what is commonly referred to as a VUCA world. This environment necessitates the preparation of learners to cope with evolving global trends. Education plays a pivotal role in providing learners of the 21st century with essential skills and competencies to adapt to the swiftly changing global society. These skills include learning and innovation skills, information skills, media and technology skills, as well as life and career skills (Sasima Suksawang, 2019).

In today's interconnected world, the exchange of information and knowledge occurs within seconds. Learners must possess analytical thinking skills to discern and logically reflect upon received information. Critical thinking, defined as an intellectual process characterized by comprehensive reasoning, plays a crucial role in this regard (Sarinya, 2019). Critical thinking enables learners to analyze, compare, and evaluate information, fostering problem-solving capabilities in unfamiliar or unexpected situations. In nursing education, critical thinking is indispensable for developing analytical abilities, facilitating sound decision-making, and ensuring the delivery of accurate and safe nursing care.

While various teaching strategies exist to cultivate critical thinking in nursing students, teaching through reflection stands out as an effective method (Teekman, 2000). Reflection allows students to review and contemplate their actions, seek solutions through reasoned problem-solving, and contribute to self-improvement, enhancing the effectiveness of nursing

practice (Armstrong et al., 2017). Consequently, teaching through reflection aids nursing students in developing appropriate thinking and decision-making processes in their practice.

Previous research on critical thinking among nursing students indicates that a majority exhibit only a moderate level of critical thinking ability (Krueamat Petchu and Phongsri Wanitsupawong, 2013). Some studies reveal that students lack opportunities to apply analytical thinking in clinical situations during nursing practice (Teekman, 2000). Quality assessments of nursing graduates also highlight lower scores in intellectual skills, particularly critical thinking. This aligns with evaluations of learning outcomes and graduate-quality information, consistent with the evaluation results of third-year nursing students in the subject of mental health practice and psychiatric nursing, it was found that intellectual skills had the lowest scores among all learning outcomes. Additionally, practical instruction for third-year nursing students, during which they spend the most time in clinical practice, requires the development of analytical thinking skills and an increase in critical thinking ability to support appropriate clinical decision-making. This indicates a need for further investigation. Given the aforementioned issues, the researcher undertakes a study to investigate the critical thinking ability of nursing students by developing a learning management model through participatory reflection. This model aims to enhance critical thinking skills, enabling nursing students to provide appropriate nursing care, think critically, and solve problems in complex situations, ultimately ensuring the delivery of safe and efficient nursing care.

In constructing a Reflective Learning Management Model for Improving Critical Thinking Skills in Nursing Students, the researchers systematically synthesized the study process through the application of principles and theories pertaining to critical thinking.

The concept of Reflective Thinking in this study composed of 1) Describing Experience: This involves comprehensively detailing events. 2) Feeling: It involves the reciprocal exchange of experiences. 3) Analysis: This phase entails analyzing situations to comprehend how learners utilize past experiences to interpret new scenarios. 4) Learning: This involves maintaining openness to diverse perspectives and opinions and 5) Experiment: This stage involves creating new hypotheses derived from connecting existing knowledge for application in addressing issues in novel, contextually appropriate nursing practice situations. In addition, the concept of Critical thinking in this study composed of 1) Identifying the Problem: This phase necessitates the recognition and analysis of the underlying causes of the presented issue. 2) Collecting Relevant Data: Consideration of the reliability of the source of information. 3) Evaluating the Credibility of Information Sources: It involves assessing the reliability of the collected information source. 4) Analyzing Alternatives: This step encompasses the definition of potential options for resolving the identified problem. 5) Decision Making and Implementation: In this stage, the selection of the most advantageous course of action is made for effective problem-solving within the practical context of nursing application and 6) Evaluation: The assessment of outcomes is conducted to ascertain the applicability of acquired knowledge in decision-making for nursing practice when confronted with analogous situations.

Research methodology

This study employs a research and development (R&D) approach to formulate a learning management model through participatory reflection aimed at enhancing critical thinking among nursing students. The research consists of four distinct steps:

Step 1: Analyzing the problems and requirements of learning management through participatory reflection (Research R1). The primary objective is to investigate existing issues related to the critical thinking abilities of nursing students and identify the needs for learning management through reflection. The sample group, purposefully selected, comprises 95 nursing instructors teaching courses in mental health practice and psychiatric nursing at the Faculty of Nursing, along with 5 experts specializing in organizing reflective learning in nursing subjects. Actions undertaken include: 1) Examining and analyzing principles, concepts, theories, and existing research related to enhancing critical thinking and managing learning through reflection and participation; 2) Investigating the current issues regarding the critical thinking abilities of nursing students; 3) Conducting interviews with experts proficient in organizing reflective learning in nursing subjects, addressing the need for learning management through participatory reflection. Data collection involved the use of a structured questionnaire addressing current problems related to the critical thinking abilities of nursing students, which was administered to nursing instructors teaching mental health practice and psychiatric nursing. Additionally, interviews with experts were conducted using a tool developed by the researchers, which was verified for quality by five experts. The validity value came from the Index of Item-Objective Congruence (IOC) of 0.83, and the reliability measured by the Cronbach's alpha coefficient of 0.76. Data analysis encompasses determining the mean and standard deviation concerning the existing problems regarding the critical thinking abilities of nursing students, along with content analysis focusing on learning management and the need for learning management through appropriate participatory reflection.

Step 2: Development of a learning management model through participatory reflection (Design and Development D1). This phase leverages the findings from Step 1 to establish guidelines for the model's development. The learning management model is designed with the purpose of creating a draft through participatory reflection and analysis. The collected data is meticulously analyzed to serve as a framework for drafting the model, encompassing principles, objectives, content, and the format for measurement and evaluation. The draft undergoes planning, review, and development with active participation from curriculum administrators and nursing instructors specializing in mental health and psychiatric nursing. A focus group discussion is conducted to incorporate suggestions for refining the draft model, culminating in the creation of a manual for organizing learning through participatory reflection. The draft model undergoes a quality examination by five experts to assess its appropriateness and consistency. The validity value came from the Index of Item-Objective Congruence (IOC) of 0.85. Format reviewers include experts in teaching reflection in nursing subjects, teaching nursing students' critical thinking abilities, and curriculum and teaching experts. The model is refined based on feedback before progressing to a pilot study before its actual implementation.

Step 3: Examination of the effectiveness of the learning management model through participatory reflection (Implementation: Research R2). In this phase, the learning management model developed in Step 2 is implemented to study its effectiveness. The researcher utilizes purposive sampling, selecting third year nursing students meeting the model's usage conditions alongside volunteers registered for nursing practice courses related

to mental health in the academic year 2021. The sample size is determined based on a sample size table and adjusted for a 20 percent increase to account for potential sample loss during the experiment, resulting in a final sample size of 30 participants. The experiment employs a pre-experimental research type, specifically a one-group pretest-posttest design, using three virtual simulation situations in nursing practice for mental health scenarios with standard patients (SP). Various instruments, developed and adjusted by the researcher, including assessments of critical thinking ability, reflective behavior, and satisfaction with the learning management model, undergo inspection by five experts for quality assurance. The validity value came from the Index of Item-Objective Congruence (IOC) of 0.63, 0.72, and 0.80. Data analysis involves mean and standard deviation calculations and T-test comparisons.

Step 4: Follow-up on the transfer of learning management through participatory reflection (Evaluation: Development D2). This phase aims to track the outcomes of the experiment in Step 3 by monitoring the transfer of learning through participatory reflection towards enhancing the critical thinking abilities of nursing students. Purposive sampling is employed to select informants, specifically fourth-year students enrolled in the Bachelor of Nursing Science Program, who participated in the experiment during Phase 3. Ten participants voluntarily provided data for the researcher to follow up on while practicing nursing in various contexts. Data collection involves in-depth interviews using a structured interview form, analyzing the content to reflect the enduring impact of learning management through participatory reflection. This research has received approval from The Human Research Ethics Committee at The Suphanburi Provincial Public Health Office, with certification number REC No. 18/2565.

Research results

The findings of the research aimed at developing a learning management model through participatory reflection to enhance critical thinking among nursing students are presented below.

Study of problems and needs for learning management through participatory reflection:

1. The investigation into the problems and needs for learning management through participatory reflection revealed that nursing students' critical thinking problems were at a moderate level ($M= 3.48$, $SD = 0.56$). The biggest problems that were found were making decisions, putting data into groups and linking them, and finding problems in nursing practice that affected physical, mental, emotional, and social aspects. On average, these problems were at a high level ($M= 3.84$, $SD = 0.83$).

2. In-depth interviews with experts in organizing reflective learning in nursing subjects further highlighted three key issues: 1) Learning through reflection promotes analytical thinking and appropriate nursing practice methods; 2) Reflection after immediate experiences enhances understanding; 3) Organizing learning through appropriate reflection stimulates critical thinking.

Development of a Learning Management Model through Participatory Reflection:

1. The learning management model developed through participatory reflection consists of five steps.

2. Activity Preparation: Instructors prepare students with relaxation activities before engaging in learning management activities.

3. Introduction: Instructors review the understanding of learning management with virtual simulation situations, assess students' knowledge about nursing for people with depression, and guide students into learning management.

4. Activity Steps: Student representatives practice nursing in virtual simulation situations, applying the nursing process to virtual patients experiencing depression. The observation group observes the behavior of the students in the simulation situation, followed by a collective learning summary.

5. Reflection and learning. Summary: This step involves five components: 1) describing the situation; 2) expressing feelings towards the situation; 3) analyzing principles and concepts used in the situation; 4) learning from the situation; and 5) summarizing practices for application in new situations.

Study of the effectiveness of the learning management model through participatory reflection:

The evaluation of the learning management model's effectiveness through participatory reflection measured the critical thinking ability of nursing students. Statistical analysis indicated a significant difference in mean scores before and after the experiment ($t (30) = 4.01, p<.01$).

Table 1 Critical Thinking Ability Scores of Nursing Students (n=30) Before and After Participation in the Reflective Learning Model

Critical Thinking	M	SD	t	df
Before	20.16	2.76		
After	23.63	3.33	4.01	29

* $p<.01$

The Impact of Reflective Learning on Nursing Students' Learning and Critical Thinking Abilities:

This research explores the outcomes of incorporating reflective thinking into learning management, aiming to enhance the critical thinking abilities of nursing students. Through the analysis of participants' reflections, three main themes emerged:

1. Application of Knowledge in Real-Life Patient Care: Participants reported that engaging in learning management activities allowed them to apply theoretical knowledge effectively in real-life patient care situations. One participant expressed, "During my internship, participating in learning management activities significantly enriched my knowledge and experience." "I was able to care for a depressed patient confidently, as I had previously encountered a similar case during the learning activity. I believe that connecting knowledge gained from learning activities to practical situations is crucial."

2. Effective Problem-Solving: The research revealed that nursing students could actively address and solve patient-related problems after participating in learning management activities. A participant stated, participating in learning management activities empowered me to address and solve issues faced by depressed patients. Beyond imparting theoretical knowledge, these activities enabled me to assist patients in recognizing their self-worth. By encouraging them to express their feelings and acknowledging support from family and friends, I helped them overcome depression effectively.

3. Confidence in Adequate Patient Care: The findings indicate that nursing students developed increased confidence in providing appropriate patient care after engaging

in learning management activities. One participant shared, through my participation in learning management activities, I gained a deeper understanding of caring for depressed patients. I could apply my knowledge and techniques confidently. Witnessing and comprehending the nursing care for depressed patients during these activities significantly boosted my confidence in providing accurate and compassionate care.

Discussion

The study demonstrates the positive impact of reflective thinking in learning management on nursing students' critical thinking abilities. It emphasizes the importance of linking theoretical knowledge to practical situations, enhancing problem-solving skills, and fostering confidence in patient care. These findings underscore the significance of incorporating reflective thinking strategies into nursing education to prepare students for effective and compassionate healthcare practice.

1. The results of developing a learning management model through participatory reflection to enhance critical thinking among nursing students were developed by those involved in developing the model, including the teachers responsible for the curriculum, nursing lecturers in the fields of mental health nursing and psychiatry, and experts with expertise in curriculum and teaching. It can be considered that this form of learning management arose from participation in development, using the participation process of those involved. The participants saw the benefits of developing the learning management model. Therefore, work planning and learning management formats were created and gradually developed together. Various procedures were developed, and opinions were shared on developing an appropriate format (King Prajadhipok's Institute, 2018), in which the development of learning management models consisted of 4 phases: 1) Studying the problems and needs of learning management through reflection (R1); 2) Developing learning management models through participatory reflection (D1); 3) Results of the study of the effectiveness of the learning management model through reflection (R2); and 4) The clear purpose of the developed learning management model was to enhance critical thinking among nursing students. Participatory reflection led to the development of a learning management model that comprises five steps: 1) activity preparation step; 2) introduction step; 3) activity implementation step; performing activities according to virtual simulation situations; 4) reflection step; thinking and summarizing learning; 5) evaluation stage. The activity preparation step was preparation to help students relax and create an atmosphere that created motivation for learning in each step of the model, consistent with Ryan & Deci (2000), who stated that the creation of motivation within a person would allow them to act or do an activity with intention and have motivation to continue learning in the next few steps. It involved the preparation of the environment according to the situation (scenario), preparing the virtual patient, and reviewing previous knowledge on nursing practice for depressed patients, consistent with the study of Alden & Durham (2012), who stated that reviewing prior knowledge is a reflection before performing work or learning, to help draw on learners' previous knowledge and experiences to use in nursing practice. It aimed to add new knowledge, prepare, and build confidence. The process of carrying out activities according to virtual simulation situations in nursing practice for depressed patients, up to the point of reflection and summary of the learning and evaluation stages, revealed that students who entered the virtual simulation situation were able to perform nursing activities correctly and completely the steps. According to the research by Henriksen, Richardson, & Mehta (2017), learners who observed could describe events, gather information, find nursing

problems and connect knowledge, concepts, and theories, and use the nursing process to give complete, reasonable care for depressed patients. This is in line with the idea of reflection, “let’s people say what they think about different ways of solving problems and is a link between knowing something and being able to solve a problem.” This was consistent with the study of Johns (2017), which said that reflection on learning helps individuals reflecting on their own practices, leading to further learning and self-development. They collaborated to synthesize their learning and establish connections with their prior knowledge or experiences, enable them to tackle new situations with appropriate, comprehensive, and clear problem-solving.

2. The Experts, including teachers responsible for the curriculum, nursing lecturers in the fields of mental health nursing and psychiatry, and experts with expertise in curriculum and teaching, developed a participatory reflection-based learning management model beneficial for enhancing critical thinking among nursing students. This form of learning management could be considered to have resulted from all experts' participation. This was the strength of the gradual creation of the model, crystallizing knowledge toward its creation (King Prajadhipok's Institute, 2018). We divided the learning management model development phase into four stages: Phase 1: Studying the problems and needs of learning management through reflection (R1); Phase 2: Developing a learning management model through participatory reflection (D1); Phase 3: Studying the effectiveness of the learning management model through reflection (R2); and Phase 4: Monitoring the transfer of learning through participatory reflection (D2).

The clear purpose of the developed learning management model was to enhance critical thinking among nursing students. Participatory reflection led to the development of the learning management model, which was consisted of five steps: 1) activity preparation step; 2) introduction step; 3) activity implementation step performing activities according to virtual simulation situations; 4) reflection step; thinking and summarizing learning; and 5) evaluation stage. At each step of the model, the activity preparation step was intended to help students relax and create a conducive learning environment. This approach aligned with Ryan & Deci (2000) theory, which suggested that fostering motivation within a person enabled them to act or perform an activity with intention and maintain motivation for subsequent steps. It included preparing the environment according to the situation (scenario), preparing the virtual patient, and reviewing previous knowledge on nursing practice for depressed patients. The researcher presented the learning management model through reflection, the PARSE Model, in Figure 1.

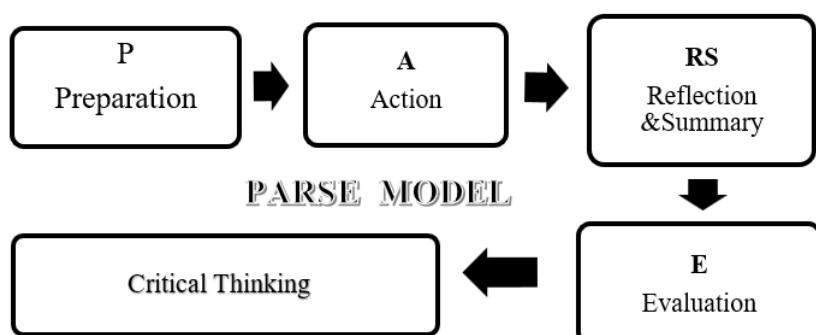


Figure 1. PARSE model

This was consistent with the study of Alden & Durham (2012), who stated that reviewing prior knowledge was a reflection before performing work or learning to help draw on learners' previous knowledge and experiences to use in nursing practice, to add new knowledge, prepare, and build confidence. Up until the reflection, summary of learning, and evaluation stage, doing activities based on virtual simulation situations in nursing practice for depressed patients showed that students who took part in learning management activities in simulated situations could perform nursing tasks correctly and finish all the steps. According to the study by Henriksen, Richardson, & Mehta (2017), learners who observed could describe events, gather information, find nursing problems, connect knowledge, concepts, and theories, and use the nursing process to give complete, reasonable care for depressed patients. This is in line with the fact that reflection showed opinions about different ways or approaches to solving problems and was a link between knowledge and problem-solving. This was consistent with the study of Johns (2017), which said that reflection on learning helped individuals reflect on their own practice, leading to further learning and self-development. They collaborated to synthesize their learning and establish connections with prior knowledge or experiences, enabling them to tackle new problems in a manner that was appropriate, all-encompassing, and lucid.

The results of studying the effectiveness of the learning management model through reflection to enhance critical thinking among nursing students revealed that the critical thinking ability of nursing students was higher than before the experiment. This was due to the development process of developing a learning management model through reflection, which was achieved through the participation of those involved in developing the model, resulting in a learning management model through reflection with more clarity. Learners could connect the nursing process to 1) identifying issues, 2) gathering relevant information, 3) considering the reliability of information sources, 4) analyzing alternatives, 5) making choices, and 6) the practice stage. The five steps of reflection were: 1. Describe the situation that occurred, 2. Feel about the situation, 3. Analyze the principles and concepts used in the situation, 4. Learn from the situation, and 5. Summarize the practices that will be used in new situations. This learning management model included reflection and exchange of learning within student groups. Using reflective questions from teachers helped stimulate students to think in a variety of ways and develop their critical thinking ability. They were able to analyze data systematically in a systematic way by relying on the knowledge learned and the knowledge exchanged, deciding, choosing the approach, and solving problems in the best way (Chettha Kaewprom, Aranya Buntham, Lalana Prathum, & Sophinsiri Yutthawisutthi, 2014). It was found that teaching and learning organized through reflection promoted nursing students' clinical decision-making abilities. Students had the opportunity to reflect on past situations and reflect on their own, together with receiving reflection information from peer groups and instructors. Additionally, reflection helped students reflect on their own feelings and actions, evaluate their own potential, learn their own shortcomings, and find ways to improve.

3. The study on the effectiveness of the learning management model through reflection in enhancing critical thinking among nursing students revealed that their critical thinking ability had increased comparing to before the experiment. " The participation of those involved in the model development process led to the development of a clearer learning management model through reflection. Learners could connect the nursing process to 1) identifying issues, 2) gathering relevant information, 3) considering the reliability of information sources, 4) analyzing alternatives, 5) making choices, and 6) the practice stage. The five steps of reflection were: 1. describing the situation that occurred; 2. feeling about

the situation; 3. analyzing the principles and concepts used in the situation; 4. learning from the situation; and 5. summarizing the practices that would be used in new situations. This learning management model included reflection and the exchange of learning within student groups. Using reflective questions from teachers helped stimulate students to think in a variety way and develop their critical thinking abilities. By relying on their learned and exchanged knowledge, they were able to analyze data systematically, make decisions, select the best approach, and solve problems effectively (Chettha Kaewprom, Aranya Buntham, Lalana Prathum, & Sophinsiri Yutthawisutthi, 2014). Additionally, reflection helped students reflect on their own feelings and actions, evaluate their own potential, learn their own shortcomings, and find ways to improve and enhance themselves."

4. The results of a follow-up study on the transfer of learning through participatory reflection from nursing students who participated in the learning management format showed that students were able to effectively transfer their learning into practice and apply it to new situations. It was found that participating in the learning management format through reflection allowed learners to evaluate themselves, understand themselves, and prepare for learning by reviewing their previous knowledge and experiences to connect and apply them to nursing practice. It also added new knowledge, building their confidence.

Additionally, this learning management format through reflection increased learners' knowledge and confidence in nursing practice for patients with depression. The research results indicated that, when following up on nursing students visiting chronic patients with depression at home, the students provided nursing care according to the correct steps and were confident in doing so. This reflected that the learning management format through reflection helped students develop critical and analytical thinking skills. Nursing students were able to transfer learning from theory to practice and apply their knowledge and practical skills to new situations. They demonstrated appropriate analytical thinking and decision-making when nursing chronic patients with depression in the community.

The follow-up results on the transfer of learning through participatory reflection included three key points, as follows:"

Point 1: Linking knowledge to apply to patients in real-life situations. Upon the researcher's follow-up with students visiting the homes of depressed patients, they discovered that the new situations they encountered paralleled a simulation scenario in terms of learning management through reflection. Students could apply their nursing knowledge. For example, as stated, "I used various techniques that I still remembered from participating in learning management activities in simulation situations to apply to my patients. I let my aunt talk and vent her feelings. And I told my aunt to praise herself for being able to take care of her sick mother, caring for a disabled younger sibling, taking good care of her two young grandchildren, and letting the aunt practice to strengthen herself. Auntie would be proud of herself. I saw my aunt's face brighten." This aligned with the study of Ruchirachai Muangkae and Jirawan Winalaiwanakul (2019), which stated that the ability to transfer the learning of nursing students practicing in the nursing laboratory should involve nursing problem situations and practical skill steps that students will encounter in actual work.

Point 2: Solving problems in reality. When the researcher followed up with students visiting the homes of depressed patients through observation while the students were providing nursing care, it was found that the students were able to provide nursing care correctly according to the nursing steps they had learned in the form of learning management through reflection. This involved the transfer of learning from theory to practice, a skill that nursing students must possess, particularly in nursing laboratory practice and learning. This process promotes learning by enabling students to solve problems in simulated scenarios

before applying their knowledge and various skills to tackle real-world problems in similar situations (Rujirachai & Chirawan, 2019). For instance, the statement, "When I came to intern, I met really depressed patients," illustrates this concept. I think that the activities that I participated in before this internship allowed me to learn about and understand depressed patients before actual practice. It made me think and reconsider how to provide nursing care that correctly addresses the problems of depressed patients. And I have actually used various techniques to make the patient talk about his problems with us. He vented his feelings to us."

Point 3: Being confident in providing correct patient care. For example, as stated, "From the fact that I have entered the learning management format, it makes me see more pictures, and I can apply the techniques for nursing depressed patients because I remember them, understand them, and use them without fear at all. I feel more confident." Vizeshfar, Dehghanrad, Magharei, & Sobhani (2016) found that role-playing teaching enabled the confident transfer of nursing students' learning knowledge to nursing practice, serving as a teaching activity to prepare students for real-world situations. Additionally, Trail Ross, Otto, & Helton (2017) found that simulations combined with role-playing could help nursing students increase their confidence in assessing patient health when practicing.

Conclusion

From the results of developing this learning management model, learning through reflection helped learners connect previous knowledge and experiences to solving problems and applying nursing practice guidelines in new situations, thus promoting the critical thinking ability of nursing students. Recommendations for implications are 1) the developed learning management model excels in the preparation stage for learners as it helps them review their knowledge, build self-confidence, and encourages them to seek knowledge. Additionally, the teacher prepares questions at each reflection stage, linking them to real-life situations to encourage critical thinking and problem-solving related to nursing issues. Teachers who apply this learning management model should prepare learners in advance and develop questions that stimulate critical thinking at every stage of reflection. Learners find the process enjoyable and engaging. 2) The developed learning management model enhances learners' analytical thinking by encouraging more rational and systematic approaches. Reflection helps learners understand reasoning, connect ideas, and apply knowledge to make accurate and appropriate decisions in nursing practice. For teachers applying this learning management model to sustain learners' critical thinking, it is important to expose learners to situations similar to those in the learning model or provide opportunities for real-world practice. Teachers should follow up with learners to assess the persistence of their critical thinking skills. The **recommendations for future research are** 1) This learning management model effectively develops critical thinking skills. Future research could expand its application to other groups beyond nursing students. The model can be adapted to promote critical thinking in learners from medical, public health, or other relevant fields. 2) A study that assesses the effectiveness of the developed learning management model through experimental designs, comparing its impact with traditional teaching methods, could provide valuable insights into its efficacy."

References

Alden, K., & Durham, C. (2012). *Integrating reflection in simulation: structure, content, and process*. Chapter 8 in Sherwood, G. and Horton-Deutsch, S. (2012) (Eds.) Reflective Practice: Transforming Education and Improving Outcomes. Indianapolis, US: Sigma Theta Tau International.

Armstrong, G., HortonDeutsch S., & Sherwood, G. (2017). *Reflection in clinical contexts: learning collaboration and evaluation*. In Horton-Deutsch S, Sherwood GD. (Eds) Reflective Practice: Transforming Education and Improving Outcomes. Indianapolis: Sigma Theta Tau International.

Chettha, K., Arunyabundhum, O., Lalalana, P., & Sophitsiri, Y. (2014). Opinions of students towards writing reflective journals. *Journal of Nursing and Education*, 7(3), 101-112. (In Thai)

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334.

Henriksen, D., Richardson, C., & Mehta, R. (2017). Design thinking: A creative approach to educational problems of practice. *Thinking Skills and Creativity*, 26, 140-153. <https://doi.org/10.1016/j.tsc.2017.10.001>

Johns, C. (2017). *Becoming a reflective practitioner*. John Wiley & Sons.

Johns, C. (2000). *Becoming a Reflective Practitioner*. London: Blackwell Science.

King Prajadhipok's Institute. (2018). *Public participation*. Bangkok: King Prajadhipok's Institute.

Rujirachai, M., & Chirawan, W. (2019). Instructional management to promote nursing students' ability to transfer learning in clinical practice. *Journal of Nursing and Community*, 13(1), 23-34. (In Thai)

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55(1), 68.

Sarinya, M. (2019). Development of critical thinking skills in the 21st century. *MCRNU Journal*, 3(2), 105-122. (In Thai)

Sasima, S. (2019). "VUCA World: Challenges for New Leaders". Retrieved from <https://www.sasimasuk.com/16768188/vuca-world.>, April 17, 2020.

Teekman, B. (2000). Exploring reflective thinking in nursing practice. *Journal of Advanced Nursing*, 31(5), 1125-1135.

Trail Ross, M.E., Otto, D.A., & Helton, A.S. (2017). Benefits of simulation and role-playing to teach performance of functional assessments. *Nursing Education Perspectives*, 38(1), 47-48.

Vizeshfar, F., Dehghanrad, F., Magharei, M., & Sobhani., S. (2016). Effects of applying role-playing approach on nursing students' education. *International Journal of Humanities and Cultural Studies, Special March*, 1772-1781.