

CHAPTER 5

Results, Discussion and Recommendation

The purposes of this research and development study entitled “Strategies Development to Enhance Critical Thinking for Nursing Students in Public Institutes” were to 1) explore the current situation and expectation on critical thinking enhancement for nursing students in public institutes; 2) construct and develop the critical thinking enhancement strategies for nursing students in public institutes; and 3) examine the implementing results on selected critical thinking enhancement strategies for nursing students in public institutes.

Results

The results of this study are chronologically reported in three phases as followed:

Phase 1 The exploration of the current situation and expectation on critical thinking enhancement for nursing students in public institutes

The steps and results of this phase were

1. The three instruments were constructed in forms of: 1) questionnaire for academic administrators and instructors; 2) questionnaire for nursing students; and 3) semi-structured interview for instructors. These preliminary instruments were content validated by 5 experts. The analysis of experts' opinions was done; items with IOC $>.50$ were selected and listed in the questionnaire and semi-structured interview.

Both questionnaires for academic administrators and instructors, as well as nursing students being put into practice in order to explore the current situation and expectation on critical thinking enhancement for nursing students were tested for internally consistent reliability. The results of Cronbach's Alpha Coefficient were 0.786. and .843 respectively.

2. Samples consisted of 8 academic administrators selected with purposive sampling technique, 220 instructors and 355 nursing students selected with simple random sampling technique. They were asked to participate in answering questionnaires. As for the instructors, eight of them, which were purposively selected, were asked to participate in the in-depth interview. Data was analyzed and presented in terms of means, standard deviations, and *t*-test. Their additional opinions were categorized according to content analysis. It was found out that the expectation on critical thinking enhancement of nursing students was higher than that of the current situation. Content analysis and SWOT analysis were conducted by researcher for tentative strategies that could enhance critical thinking of nursing students. Four focal aspects were thematized as followed: 1) roles of administrator on policy driving for critical thinking; 2) roles of instructors that could enhance critical thinking; 3) pedagogical practice that could enhance critical thinking; 4) roles of nursing students that could enhance critical thinking.

Phase 2 The construction and development the critical thinking enhancement strategy for nursing students in public institutes.

The steps and results of this phase were as followed:

1. Tentative strategies from phase I were analyzed and synthesized while SWOT analysis was done by 16 instructors who were selected with purposive sampling technique. The results were as followed.
 - 1.1 Internal contributing factors on critical thinking enhancement for nursing students, which were used for drafting tentative strategies, contained 13 strength items and 12 weakness items.
 - 1.2 External contributing factors on critical thinking enhancement for nursing students, which were used for drafting tentative strategies, contained 4 items of opportunities and 12 items of threats.
 - 1.3 Regarding SWOT analysis, items were weighted in TOWS matrix and found out that SO = 2.12, 1.20; WO = 1.20, 1.85; ST = 2.12, 2.41; and

WT = 1.85, 2.41. Thus, strategies of critical thinking enhancement for nursing students should be emphasized on promoting existing strengths and driving threat adjustment.

1.4 After the SWOT analysis, samples drafted preliminary strategies critical thinking enhancement for nursing students which were consisted of 1 vision, 4 missions, 4 goals, 4 strategy issues, 9 strategies, 17 measures, 31 indicators, and 31 evaluation methods.

2. Preliminary strategies of critical thinking enhancement for nursing students were then explored for their quality, feasibility, utility, propriety and accuracy by 5 experts. The items in strategies with accepted score of > 3.5 were selected for further step of the study. Strategies were modified with the application of recommendation of the experts. The final draft of the strategies of critical thinking enhancement for nursing students were consisted of 1 vision, 4 missions, 4 goals, 4 strategy issues, 10 strategies, 19 measures, 26 indicators and 26 evaluation methods. The detail of strategies on critical thinking enhancement for nursing students were as followed:

Strategy Issue I: Instructional design management focused on critical thinking enhancement consisting of 3 strategies;

Strategy I: Increase participation in policy setting in instructional design focused on critical thinking enhancement consisting of 2 measures: 1) assigning instructors to participate in policy setting on instructional design focused on critical thinking enhancement; and 2) identifying guideline on management of instructional design focused on critical thinking enhancement;

Strategy II: Promote recognition and positive attitude on management of instructional design focused on critical thinking enhancement consisting of 2 measures: 3) increasing recognition and positive attitude on management of instructional design focused on critical thinking enhancement for instructors; and 4) regulating terms of reference (TOR) for instructors to instructional design focused on critical thinking enhancement;

Strategy III: Augment competency of instructors in critical thinking consisting of 2 measures: 5) appraise characteristics and skills on critical thinking among instructors; and 6) augmenting characteristics and skills on critical thinking among instructors.

Strategy Issue II: Provide and manage contributing factors to instructional design focused on critical thinking enhancement consisting of 2 strategies

Strategy IV: Supportive environmental development for instructional design focused on critical thinking enhancement consisting of 3 measures: 7) developing technology and its network to support the production of media and activities for various instructional design; 8) develop building and space to facilitate self-directed learning and knowledge sharing; and 9) Create educational media for critical thinking enhancement.

Strategy V: Promote morale and encouragement for instructors to administer instructional design focused on critical thinking enhancement consisting of 1 measure: 10) dealing with allocating budgets for instructional design activities for critical thinking enhancement.

Strategy Issue III: Augment instructors' capacities on instructional design for critical thinking enhancement consisting of 2 strategies

Strategy VI: developing instructors' capacities on instructional design for critical thinking enhancement consisting of 2 measures: 11) improving instructors' knowledge and skills for administering instructional design activities for critical thinking enhancement; 12) promote knowledge sharing to enhance critical thinking among instructors.

Strategy VII: Amplify the use of media and various technologies for critical thinking enhancement among instructors consisting of 1 measure; 13) provide training workshops on the use of media and various technologies for critical thinking enhancement among

instructors.

Strategy Issue IV: Promote and strengthen nursing students' critical thinking development consisting of 3 strategies;

Strategy VIII: Integrating instructional design focused on critical thinking enhancement consisting of 2 measures: 14) Integrate learning activities that promote–critical thinking; and 15) Integrate nursing process and critical thinking into instructional design to enhance critical thinking.

Strategy IX: Developing extracurricular activities for critical thinking enhancement consisting of 2 measures: 16) Development projects/activities for critical thinking enhancement; 17) Integrate students' development activities and critical thinking enhancement.

Strategy X: Appraisal of characteristics and skills on critical thinking in nursing students consisting of 2 measures: 18) guideline development of appraisal of characteristics and skills on critical thinking in nursing students ; 19) appraisal design of activities of characteristics and skills on critical thinking in nursing students.

3. As for selection of strategy for the implementation and evaluation instruments' psychometric properties, sixteen instructors, samples in phase 2, stage 1, were asked for their opinions. The details were as followed:

- 3.1 Strategy selected for the implementation included the strategy issue IV - promoting and strengthening nursing students' development to be critical thinkers and strategy VIII - integrating instructional design focusing on critical thinking enhancement as well as Measurement VX – integrating nursing process and critical thinking into instructional design to enhance critical thinking;

- 3.2 Samples carefully went through and modified manual of instructional design for critical thinking enhancement. This manual identifies instructional model employing scaffolding and concept mapping in performing nursing process. The evaluation forms regarding the analysis

of case study using nursing process as well as the satisfaction evaluation of critical thinking enhancement strategy of instructors and students were adjusted.

Phase 3 The implementing results on selected critical thinking enhancement strategy for nursing students in state institutes.

The steps and results of this phase were as followed:

Stage 1 Implementing strategy

1. Implemented selected strategy in Adult and Elderly Nursing Practicum 1 during 22nd July – 20th and September, 2013. Samples were 4 instructors and 31 nursing students.
2. Systematically prepared instructors by organizing workshop on the process of instructional design with scaffolding and concept mapping and its implementation in the practicum course. The instructors were asked to follow manual of instructional design for critical thinking enhancement.
3. Critical thinking skills of nursing students were tested using critical thinking skills test or questionnaire before implementing the strategy.
4. After the implementation, nursing students were evaluated on the nursing process performance, critical thinking skills and satisfaction on the scaffolding and concept mapping methods. Instructors were evaluated their satisfaction on the strategy using scaffolding and concept mapping methods. Data was then analyzed.

Stage 2: Conclusion of the implementation.

Researcher concluded the results of the implementation as followed:

1. Average scores of nursing process performance was 27.73 (\pm 6.092) and the highest scores were in the range of 21-30 (58.06%)
2. Scores of critical thinking skills after the completion of the strategy were significantly higher than those of before the implementation.
Percentages of samples with high and moderate levels of critical

thinking skills at the completion of the strategy were statistically significantly higher than those of before the implementation. Percentage of samples with low level of critical thinking skills at the completion of the strategy was statistically significantly lower than that of before the implementation.

3. The conclusions of the evaluation on instructors' satisfaction on strategy employing scaffolding and concept mapping methods were found as followed:

- 3.1 Scaffolding and concept mapping methods could effectively improve critical thinking skills of nursing students. Instructors were able to closely monitor students' thought and learning process. Nursing students could perform systematic thinking by associating it with concepts and drawing concept map.

- 3.2 Using open ended questions and allowing for peer assisting were the methods for students when stimulating their thought to search for further information-and promote productive learning atmosphere.

- 3.3 Concept mapping was a method applicable for the creation of nursing diagnosis in nursing process. It also promoted and help develop sustainable systematic thinking process for students.

- 3.4 Overall satisfaction on instructional design using open ended questions, peer assisting, and concept mapping assignment was 9.25 of the total 10 marks.

4. The conclusions of evaluation on nursing students' satisfaction on strategy employing scaffolding and concept mapping methods were found as followed:

- 4.1 It was a method that could stimulate thought and knowledge. Answering the question was a method that could evaluate their own knowledge. They felt good when allowed to help each other to answer questions. Concept mapping was a method that makes

them think systematically.

- 4.2 Overall satisfaction on instructional design using open ended questions, peer assisting, and concept mapping assignment was 9.15 of the total 10 marks.

Discussion

The discussion on the results of strategies development to enhance critical thinking for nursing students will be presented in 2 issues: 1) the elements of strategies that could enhance critical thinking for nursing students and 2) the results of implementation of selected strategy that could enhance critical thinking for nursing students in strategy issues IV: promoting and strengthening nursing students' development to be critical thinkers; strategy VIII: integrating instructional design focused on critical thinking enhancement; measurement VX: integrating nursing process and critical thinking into instructional design to enhance critical thinking. The details are as followed:

Issues 1: The elements of strategies that could enhance critical thinking for nursing students

Researcher developed strategies on critical thinking enhancement for nursing students based on students centered concepts which were concluded as followed:

Strategy issue 1: Instructional design management focused on critical thinking enhancement which was consisted of 3 strategies: 1) increase participation in policy setting in instructional design focused on critical thinking enhancement which was consisted of 2 measurements; 2) promote recognition and positive attitude on management of instructional design focused on critical thinking enhancement which was consisted of 2 measurements; 3) augment competency of instructors in critical thinking which was consisted of 2 measurements;

Strategy issue II: Provision and management of contributing factors to instructional design focused on critical thinking enhancement which was consisted of 2 strategies: 1) supportive environmental development for instructional design focused on critical thinking enhancement which was consisted of 3 measures 2) promote morale and encouragement for instructors to administer instructional design focused on critical thinking enhancement which was consisted of 1 measure

strategy issue III: Augment instructors' capacities on instructional design focused on critical thinking enhancement which was consisted of 2 strategies: 1) development on instructors' capacities on instructional design focused on critical thinking enhancement which was consisted of 2 measures 2) amplify the use of medias and various technologies for critical thinking enhancement among instructors which was consisted of 1 measure.

Strategy issue IV: promoting and strengthening nursing students' development to be critical thinkers which was consisted of 3 strategies: 1) integrating instructional design focused on critical thinking enhancement which was consisted of 2 measures 2) development of extracurricular activities for critical thinking enhancement which was consisted of 2 measure 3) appraisal of characteristics and skills on critical thinking in nursing students which was consisted of 2 measures.

Strategies development to enhance critical thinking in this study focused on student centeredness and covered the roles of key persons who had responsibility in driving and managing teaching and learning process, including supporting instructors development and contributing factors for instructional design and students development. These results are congruent with Srilasak (2006) who studied strategy of learning and teaching development of child-centered and found that strategies that could be practically applied were in four following aspects 1) learning management that students should be allowed to be active learners; 2) learning techniques that teachers conducted activities to encourage students to construct their own learning process by providing various experiences that led to concept construction, and setting activities that led to learning participation; 3) teachers' role as learning manager that need to be facilitating the learning process, planning on experiences, being flexible for learners and reinforcing learning objective; 4) school administrators' roles on learning process that support facilitating environment such as curriculum development, resource allocation, classroom research, and medias. Moreover, administrators should monitor, supervise, and evaluate child-centered approach process.

Similarly, Witoonchat (2008) conducted the study of the development of administrative strategies for promoting child-centered learning in private basic education schools levels 1-2 in Bangkok and found out that strategies were consisted of five aspects of 1)

leadership, 2) instructor development, 3) academic, 4) general administrative development, 5) community and network cooperation development. The result of the strategy implementation demonstrated that all strategies developed had high level of appropriateness in utility, feasibility, propriety and accuracy standards.

In terms of critical thinking enhancement of nurses, Simpson & Courtney (2008) conducted the study of implementation and evaluation of critical thinking strategies to enhance critical thinking skills in middle eastern nurses. Critical thinking strategies such as questioning, debating, role playing and small group activity were developed and used in a professional development program for middle eastern nurses to promote critical thinking skills, encourage problem solving, develop clinical judgment, and prioritize care activities. Classroom learning was transformed from memorization to interaction and active participation. The intervention program was successful in developing critical thinking skills in both the nurse educators and nurses. This program successfully integrated critical thinking strategies into a Middle Eastern nursing curriculum.

Recommendations are as follows: 1) utilize evidence-based practice and stem questions to encourage the formulation of critical thinking questions; 2) support the needs of nurse educators for them to effectively implement teaching strategies to foster critical thinking skills; and 3) adopt creative approaches to (i) transform students into interactive participants and (ii) open students' minds and stimulate higher-level thinking and problem-solving abilities.

Issues 2: The results of implementation of selected strategy

The sample in this phase selected strategy issues IV: promoting and strengthening nursing students' development to be critical thinkers; strategy VIII: integrating instructional design focused on critical thinking enhancement; measurement VX: integrate nursing process and critical thinking into instructional design to enhance critical thinking. The instructional design employed scaffolding technique and concept mapping. It was found out that both instructors and nursing students were satisfied with this strategy with scores of 9.25 and 9.15, respectively from the total scores of 10. Instructors stated that it was the good strategy that could promote-students' potential and learning process development. Students were able to think systemictically and associate new knowledge with prior knowledge to draw concept mapping. It also promoted

positive learning atmosphere, embedded additional searching behaviors for students. Meanwhile, students concluded that this strategy stimulated their thoughts and knowledge. Answering questions could evaluate their own implicit knowledge. Moreover, they felt good to use peer group when helping each other and concept mapping was undertaken to gather their knowledge systematically. This research was found that the score of critical thinking skills at post test was higher than that of pre test. This was similar to the study of Tadpinit (2005) that studied the development of an instructional model enhancing nursing process competency and critical thinking skill to compare nursing process competency and critical thinking skills of the experimental group with those of a control group. Both groups were 16 third-year nursing students and randomized control was conducted. The instructional model comprised of group cooperative-thinking practice and scaffolding was used for the experimental group and the traditional model was used for the control group. The findings of the study indicated that the nursing process competency and critical thinking skills of the students in the experimental group improved significantly over those of the students in the control group as demonstrated by higher scores in the post-test ($p < 0.05$). In addition, Sanguanpuak (2005) studied the effects of scaffolding in self-access materials on students' writing. The results showed that scaffolding has positive effects on subjects' writing process and product. For the positive effects on subjects' writing process, the subjects were able to perform five steps of the writing process. And they also gradually improve their quality of performing these five steps in the later tasks although the level of support is reduced. In addition, they employed these steps to complete the post-test where they had no guidance or instruction. For the positive effects on subjects' writing product, the finding revealed that scaffolding seemed to improve subjects' ability in writing.

Regarding teaching and learning strategy employing concept mapping, Lasater & Nielsen (2009) conducted the study of the influence of concept-based learning activities on students' clinical judgment development. This study evaluated the effect of concept-based learning activities on the development of clinical judgment in baccalaureate nursing students. The design of this study was quasi-experimental, with the treatment being an exposure to two, three, or four concept-based learning activities for students in the treatment group, whereas students in the control group had never been exposed to

concept-based learning activities. Following the measurement of clinical judgment in both groups, a focus group consisting of treatment group members was held to collect the qualitative data for this mixed methods study. Results suggested that concept-based learning activities were a clinical learning strategy that should be considered by faculty to deepen clinical thinking in preparation for reaching sound clinical judgments. The concept-based learning activity was helpful to relate pathophysiology directly to patient care. In addition, Tiensawas, Jaruwacharapanichkul and Pianmongkol (2001) conducted the study of the effect of concept mapping on care plan performance of third-year nursing students, Faculty of Nursing, Chiangmai university. This study was quasi-experimental, with the treatment using concept mapping in nursing care plan, whereas students in the control group used traditional method. The results showed that after using concept mapping, the experimental group perceived that they had increased ability to nursing care plan significantly ($t = -9.006, p < .001$). They thought that nursing care plan using concept mapping was easier and less time consuming. Moreover, this method was able to promote their analysis and they could focus on patient problems better than the traditional learning.

Recommendation

This study suggests that meaningful strategy development to enhance critical thinking for nursing students could encompass roles of academic administrator, roles of instructor, instructional design management and students' development. Thus, researcher suggests taking strategies into practice in 2 issues as followed:

1. Recommendation in management aspects

- 1.1 Recommendation regarding policy and management in academic institute level: The administrators need to be academic leaders that could drive the-learning process enhancing critical thinking for students. The policy should specify that academic institute must set strategy that could enhance critical thinking and support its implementation. Budget should be allocated for instructors' preparation regarding teaching and learning methods. Contributing factors for critical thinking enhancement should be effectively administered. Monitoring and evaluation of strategy implementation should be done

consistently and continuously. Instructional design for critical thinking enhancement should be considered to carry out in the whole curriculums. Instructional design for critical thinking enhancement should be stated in terms of reference (TOR) to reassure that all instructors are aware of and complied to the direction of academic institute.

- 1.2 Recommendation regarding operating level: the department should have all instructors develop their competency in instructional design for critical thinking enhancement. They should be encouraged to enhance self-confidence to transform traditional teaching and learning to facilitator or learning manager. At faculty level, coaching and mentoring system should be provided for instructors and knowledge sharing of instructional design and teaching methods to enhance critical thinking should be done to form new knowledge.

2. Recommendation for further research

- 2.1 Research should focus on strategies on critical thinking enhancement for other groups which could amplify knowledge and benefit education.
- 2.2 Strategies development on instructional design for critical thinking enhancement on each level of learner using various techniques and focusing on student-centered should be investigated. This would correspond with National Act of Education and for changing context, such as ASEAN community and preparedness on people for 21st century.

3. Recommendation for using this research

Strengthening the nursing students with critical thinking and become lifelong learners, finally. Those related to education must involves and develop all instructional strategies simultaneously. These strategies consisted of 1) roles of administrators or academic administrators to stipulate policy and provide contribution factors for supporting instruction; 2) roles of instructors who recognize increasingly positive attitude on management of instructional design; 3) provision and management of

contributing factors to instructional design for nursing students' learning; and 4) develop nursing students' characteristic of critical thinker. However, development instructional design strategies should not be focused on only promoting students, but it is also involved to other aspects. For instance, strategies for management, roles of administrators, roles of instructors, provision of contributing factors which have to plan by administrators and instructors. In addition, it is necessary to have key leader to coordinate and to be change agent obviously and should have guideline, examine, evaluation and report continuously for the successful strategies.