

CHAPTER 3

Research Methodology

This research employed research and development methodology. Researcher described the research methodology used in the present study including sample, sampling instrumentation, protection of human subjects, data collection and data analysis. The purposes of this research were to develop strategies that could enhance critical thinking for nursing students in public institutes. The research was consisted of 3 phases as followed:

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

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

Phase 3 The examination of the result of implementation of the developed critical thinking enhancement strategy for nursing students.

The research implementation can be chronologically shown in detail as followed

Research Framework

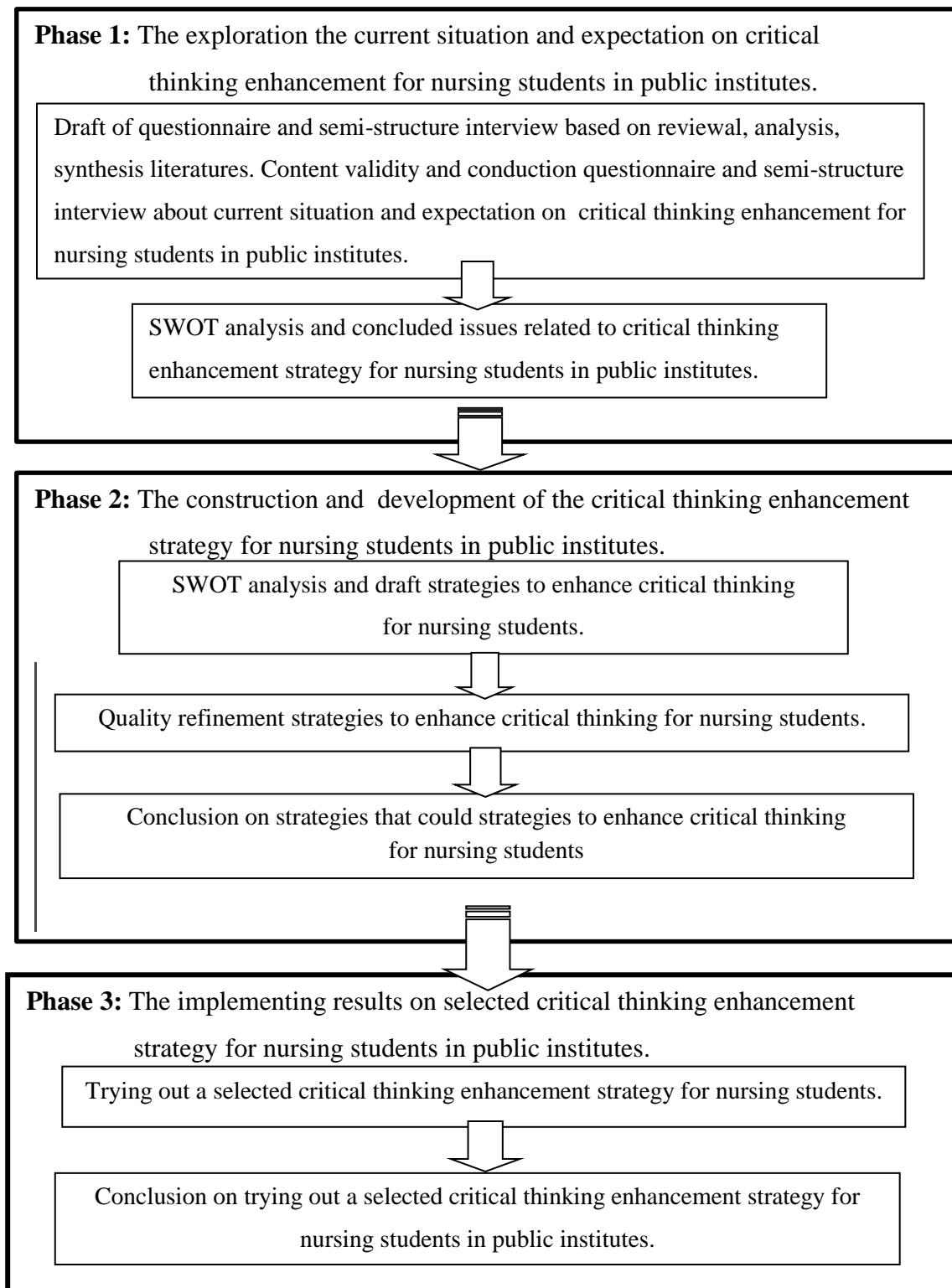


Figure 3.1 Steps of research methodology for Strategies development that could enhance critical thinking for nursing students in public institutes.

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

The purpose of this phase was to investigate the current situation and expectation of critical thinking enhancement for nursing students. The steps of this phase were as followed:

1. Population and Samples

Population of this phase consisted of

1. Administrative experts who served as content validitors.
2. Instructors and nursing students who either worked or studied in public institutes at the northern of Thailand. They were asked to try the reliability testing.
3. Academic administrators, instructors and nursing students who either worked or studied in public institutes in northern Thailand. They were asked to give their responses to the questionnaire and semistructure interview.

The detail of population was classified by status and institutes as illustrated in table 3.1

Table 3.1 Population in this study classified by status and institutes

Institutes	Academic administrator	Nursing Instructor	Nursing student (year)			
			1	2	3	4
Mae Fah Luang University	1	37	96	96	89	73
Chiangmai University	1	138	144	153	224	180
Phayoa University	1	29	77	78	83	67
Naresuan University	1	46	83	90	92	86
Boromrajonani College of Nursing, Phayoa	1	33	60	88	79	134
Boromrajonani College of Nursing, Chiangmai	1	50	80	98	103	100
Boromrajonani College of Nursing, Lampang	1	55	99	74	99	213
Boromrajonani College of Nursing, Utradit	1	32	74	73	104	87
Boromrajonani College of Nursing, Phutthachinnarat	1	57	160	122	112	109
Total	9	477	873	872	985	1049

Source: Data was derived from nursing instructors of each institute

Sample

1. The samples for content validitors were 5 administrative experts including 1 academic administrator, 3 nursing academic administrators and 1 measurement and evaluation administrator. The qualification criterion for the experts was as followed: 1) holding doctoral degrees on educational administration, nursing administration and measurement and evaluation 2) having experienced on administrating for at least 2 years and teaching for undergraduate students for at least 10 years.
2. The samples for reliability testing were selected by purposive sampling. They were 30 nursing instructors who had held master degree and experienced on teaching undergraduate students for at least 5 years and 30 nursing students who had experienced in nursing practicum.
3. The samples who were asked to give their responses to the questionnaire were 8 academic administrators selected by purposive sampling. For nursing instructors, and nursing students, sample random sampling were calculated with the application of Yamane formula (Srisuk, 2009) as followed:

$$n = \frac{N}{1 + Ne^2}$$

when n = Numbers of subject, N = Numbers of nursing instructors
 e = Sampling error (the level of precision = 5%)

The number of 211 nursing instructors was calculated and researcher estimated the responses of samples was 80%. Thus, the number of 250 nursing instructors were selected. Samples in each institute were proportionately. The 220 questionnaires were returned to researcher.

The number of 334, third and fourth year, nursing students was calculated and researcher estimated the response rate of samples was 80%. Thus, the number 390 of nursing students were selected. Samples in each institute were proportionately. The 355 questionnaires were returned to researcher.

4. Some of nursing instructors, selected by purposive sampling, were asked for indepth interview participation.

2. Instrumentation

2.1 Evaluation form for experts' opinion. The experts were informed to rate on how much the item could matches each objective which was in the preliminary questionnaire. The criteria for expert to judge rate were as followed:

- 1 = item clearly taps objective
- 0 = unsure/unclear
- 1 = item clearly does not clearly tap objective

2.2 Questionnaire for data collecting on current situation and expectation of critical thinking enhancement contained issues, rating scales, choices, and gaps filling as followed:

2.2.1 Questionnaire for academic administrators and instructors were consisted of

- 1) General data - multiple choices and gaps filling
- 2) Opinion -1) issues of roles of administration on driving policy that could enhance critical thinking for nursing students; 2) issues of roles of instructors on critical thinking enhancement for nursing students; 3) issues of pedagogical practice that could enhance critical thinking for nursing students; and 4) issues of roles of nursing students that could enhance critical thinking.

2.2.2 Questionnaire for nursing students were consisted of

- 1) General data - multiple choices and gaps filling
- 2) Opinion -1) issues of roles of administration on driving policy that could enhance critical thinking for nursing students; 2) issues of roles of instructors on critical thinking enhancement for nursing students; 3) issues of pedagogical practice that

could enhance critical thinking for nursing students; and
4) issues of roles of nursing students that could enhance critical thinking.

Rating-scaled questionnaire was contained scales as followed:

- 5 = strongly agree with current situation / expectation in each item in the questionnaire.
- 4 = agree with current situation / expectation in each item in the questionnaire.
- 3 = moderate agree with current situation / expectation in each item in the questionnaire.
- 2 = disagree with current situation / expectation in each item in the questionnaire.
- 1 = strongly disagree with current situation / expectation in each item in the questionnaire.

2.2.3 Semi-structured interview for instructors contained scales as followed:

- 1) Issues of role of administrator on policy driving to enhance critical thinking for nursing students.
- 2) Issues of role of instructors on enhance critical thinking for nursing students.
- 3) Issues of roles of nursing students on enhance critical thinking.
- 4) Issues of internal and external contributing factors affecting the management to enhance critical thinking for nursing students.

3. Procedure

Procedural steps were as followed:

3.1 Analysis and synthesis contents based on concepts, theories, literatures

and researches on related strategies that could enhance critical thinking were conducted.

- 3.2 Creation of preliminary questionnaire and semistructured interview for data collecting on current situation and expectation that could enhance critical thinking. Three focal aspects were as followed: 1) roles of administrator on driving policy to critical thinking; 2) pedagogical roles of instructors that could enhance critical thinking; 3) roles of students that could enhance critical thinking.
- 3.3 Researcher modified items in preliminary questionnaire and semistructured interview after consulting with advisors for colloquial elxpressions and clarification.
- 3.4 Endorsed letters of the Section of Research and Development in Education, Faculty of Education, Chiangmai University attached with preliminary questionnaire and semistructured interview were submitted to experts asking for quality certification. Envelope with researcher's address and stamp were enclosed. The experts were asked to return the sealed envelope to the researcher within four weeks after receiving letters.
- 3.5 The analysis of experts' opinions and content analysis were done, the IOC>.70 items were selected. Researcher modified items according to the experts' recommendation as well as updated questionnaire and semistructured interview.
- 3.6 Trying out the questionnaire with 30 instructors and 30 nursing students and conducting discriminant of power by Item Total Correlation and reliability by Cronbach's Alpha Coefficient and the reliability indication was = 0.786.
- 3.7 Updating the questionnaire and semistructured interview for further step of study was conducted.
- 3.8 Submitting the endorsed letters afore mentioned to administrators of nursing institutes in the northern Thailand asking for permission to let

samples participate in the study.

3.9 Samples were informed and asked for participation. Questionnaires and envelope with researcher's address and stamp were enclosed. The samples were asked to return the sealed envelope to researcher within four weeks after receiving questionnaire. Samples who completed and returned the questionnaire were assumed to have study participation consent.

3.10 Some of samples who served as instructors were asked to participate in the indepth interview.

3.11 Data was analyzed and synthesized. Content analysis and SWOT analysis were conducted by researcher for tentative strategies that could enhance critical thinking of nursing students.

4. Protection of Human Subjects

Written approval to conduct the study from the Institutional Review Board of the Section of Research and Development in Education, Faculty of Education, Chiangmai University, was obtained. Eligible participants were informed of the study purposes. The cover letter (Appendix B) contained the statement that the samples might not need to answer the questionnaires if they were unwilling to participate in the study. The cover letter also stated that information provided on the questionnaires would be presented or reported only in a group manner, the figures found on the questionnaire were only coding numbers of questionnaire and could not be disclosed by any means or under any circumstances. Samples participating in the study were put into 4 weeked timespan, with the exact dates noted in the cover letter. They had to complete and return the sealed envelope to researcher accordingly. Samples who completed and returned the questionnaire were assumed to have study participation consent.

5. Data Analysis

5.1 Items selection was conducted with the application of IOC (Index of Item Objective Congruence) $\geq .70$, though IOC $> .50$ is accepted (Sirichai Kanjanawasi, 2008). The formula of IOC was

$$IOC = \frac{\sum R}{n}$$

IOC = The index of the objective harmonized with item

R = Score of experts' opinion

n = Number of experts

5.2 The number of items in the questionnaire for instructor was totally 48, only 1 item was not passed the criterion and 7 items needed some adjustable colloquial expressions. The number of items in the questionnaire for nursing student was totally 42, 6 items were not passing the criterion and the experts considered 2 more items needed and also 6 items needed some adjustable colloquial expressions. For semistructured interview, all items met the criteria.

5.3 Researcher analyzed discriminant power with the application of Item Total Correlation and reliability with the application of Cronbach's Alpha Coefficient. It was found out that questionnaire had discriminant power as followed:

1) role of academic administration	0.720-0.798
2) role of instructor	0.552-0.683
3) pedagogical roles of instructors	0.607-0.717
4) role of student	0.720-0.798

the reliability = 0.786. Additional recommendation from the experts was analyzed by content analysis.

5.4 Frequency, percentage, mean and standard deviation were conducted when analyzing data derived from the questionnaire. Critirion for selection item to develop strategies was done as followed:

$$\text{Range of interval} = \frac{\text{Highest opinion score} - \text{Lowest opinion score}}{\text{Number of class}}$$

$$= \frac{5 - 1}{5} = 0.8$$

The meaning of score of opinion was as the following

Interval fo opinion	level of opinion
4.20 - 5.00	having situation/expectation on the item at “excellent” level
3.40 - 4.19	having situation/expectation on the item at “good” level
2.60 - 3.39	having situation/expectation on the item at “fair” level
1.80 - 2.59	having situation/expectation on the item at “poor” level
1.00 - 1.79	having situation/expectation on the item at “very poor” level

Items with averge of score >3.5 were selected for strategies development. Testing the difference of average with the application of the *t* test was also conducted.

5.5 All data from questionnaire and in depth interview were analyzed in terms of frequency, percentage, mean, and *t* test including content analysis.

5.6 Analysis, synthesis and SWOT analysis on exepectation, current situation and needs assessment were done tentatively.

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

Data and information in phase 1 was applicable as frame work for setting preliminary strategies. The detail of this phase was as followed:

Stage 1 Setting preliminary strategies thatcould enhance critical thinking for nursing students

The detail of this stage was as followed.

1. Population and Samples

Population of this phase contained those who worked in public institutes in northern Thailand. These institutions are under the jurisdiction of either Mininstry of Public Health or Ministry of Education.

Sixteen samples were selected by purposive sampling. The qualification criterion for the samples consisted of 1) holding master degree in nursing, at least; 2) having teaching experience with undergraduate nursing students teaching at least 5 years.

2. Instrumentation

The tentative strategies that could enhance critical thinking for nursing students.

3. Procedure

Samples were invited to discuss and consider tentative strategy issues and measurements. SWOT analysis was conducted later on. Conclusion preliminary strategies were done for further step.

4. Data Analysis

- 4.1 Samples had decided to weight data in each item in tentative strategies and followed with SWOT analysis to identify strength, weakness, opportunity and threat.
- 4.2 Discussion and conclusion to identify vision, mission, strategy issue, strategy, measure, project, indicator and measurement as well as evaluation were conducted.
- 4.3 Conclusion of preliminary strategies that could enhance critical thinking for nursing students.

Stage 2 Quality refinement strategies that could enhance critical thinking for nursing students

The detail of this stage was as followed:

1. Population and samples

Population of this stage is composed of experts who had experienced in institute administrator, nursing education administrator and/or strategy formulation.

Samples, 2 nursing education administrators, 1 academic administrator and 2 nursing instructors, were selected by purposive sampling. The qualification criterion for the samples consisted of: 1) holding doctoral degree; 2) at least 10 years teaching experience of undergraduate nursing students; and 3) having experience in strategy formulation.

2. Instrumentation

2.1 Manual of strategies evaluation consisting of research proposal and SWOT analysis results.

2.2 Preliminary strategies enhancing critical thinking of nursing students.

2.3 Strategy evaluation form which containing 4 aspects of 1) feasibility, 2) utility, 3) propriety, and 4) accuracy. This form included rating scales and the description as followed:

5 = strongly agree with item in terms of feasibility, utility, propriety, accuracy.

4 = agree with item in terms of feasibility, utility, propriety, accuracy.

3 = moderate agree in terms of feasibility, utility, propriety, accuracy.

2 = disagree with item in terms of feasibility, utility, propriety, accuracy.

1 = strongly disagree in terms of feasibility, utility, propriety, accuracy.

3. Procedure

3.1 Endorsed letters of the Section of Research and Development in Education, Faculty of Education, Chiangmai University attached with preliminary questionnaire and semistructured interview were submitted to administrators for asking for experts permission to consider quality of preliminary strategies.

3.2 The manual of strategies evaluation, preliminary strategies and strategies evaluation form for exploring quality of preliminary strategies which were covered including feasibility, utility, propriety and accuracy aspects. Envelope with researcher's address and stamp were enclosed. The experts were asked to return the sealed envelope to the researcher within four weeks

after receiving letters

3.3 All data was analyzed with frequency, percentage, means, *t* test and content analysis.

3.4 Conclusion Strategies that could enhance critical thinking of nursing students.

4. Data Analysis

4.1 Analysis experts' opinions on feasibility, utility, propriety and accuracy of strategies by frequency, percentage, and means.

4.2 Based on experts' opinions, the criterion for the selection of strategy for further step was as followed:

$$\begin{aligned}\text{Range of intervals} &= \frac{\text{Highest opinion score} - \text{Lowest opinion score}}{\text{The number of classes}} \\ &= \frac{5 - 1}{5} = 0.8\end{aligned}$$

The meaning of scores of opinions were as the followed:

Intervals of opinions	levels of opinions
4.20 - 5.00	quality of strategy was at "excellent" level
3.40 - 4.19	quality of strategy was at "good" level
2.60 - 3.39	quality of strategy was at "fair" level
1.80 - 2.59	quality of strategy was at "poor" level
1.00 - 1.79	quality of strategy was at "very poor" level

4.3 All strategies representing averages of >3.5 opinion scores were selected for further step of study. Recommendation was modified strategies completely.

Step 3 The implementation of selection of strategy to critical thinking for nursing student.

This step was done by samples in step 1 of Phase 2. They discussed and made decision on the selection of strategy for implementation. The details were as the followed:

3.1 The samples selected 1 strategy for implementation.

- 3.2 Consideration and commentation on the manual for strategies development that could enhance critical thinking of nursing students, satisfaction evaluation over the application of selected strategy, case study, critical thinking skills test (Sripai Chaiya, 1999; reliability = .78) were done by the samples.

Phase 3 The examination of results of implementation on selected critical thinking enhancement strategy for nursing students in public institutes.

Selected strategy to enhance critical thinking for nursing student was conducted in School of Nursing, Mae Fah Luang University. The details were as followed.

Step 1 The implementation of selected strategy to enhance critical thinking for nursing student.

Selected strategy for implementing was Strategy Issue 4: Promotion and supporting on development on nursing student to be critical thinker; Strategy 8: Integrating teaching and learning for promoting critical thinking; measure 2: Integrating nursing process and instructional design for critical thinking were conducted in School of Nursing. The details were as the followed:

1. Population and samples

Population of this stage consisted of instructors and nursing students who worked and studied at School of Nursing, Mae Fah Luang University. Samples were as followed:

1.1 Four instructors selected through purposive sampling. The qualification criterion for the samples consisted of: 1) holding Master degree, at least; 2) having pedagogical experience in Adult and Elderly Nursing Practicum 1 during the period of study.

1.2 Thirty one nursing students were selected through purposive sampling. The qualification criterion for the samples dealt with registration in Adult and Elderly Nursing Practicum 1 during the period of study.

2. Instrumentation

2.1 The manual for strategies development that could enhance

critical thinking for nursing students.

2.2 Critical thinking skills test (Sriprai Chaiya, 1999).

2.3 Test of situation analysis from case study with the application of nursing process.

2.4 Satisfaction evaluation form for using the selected strategy for instructors and nursing students.

3. Procedure

3.1 Researcher met with the Dean and School of nursing committee, Mae Fah Luang University and informed objectives of study, detail for implementation of strategies to enhance critical thinking for nursing student and asked for permission for the implementation.

3.2 After getting permission, researcher met co-ordinator of Adult and Elderly Nursing Practicum 1 and informed the detail of study and asked 4 instructors and 31 nursing students who were in the period of study to participate in this study.

3.3 Preparedness was done for 4 instructors by workshop to clarify the pedagogical practice according to the manual of strategy to enhance critical thinking of nursing students. Instructors had to turn their traditionally pedagogical technique into integrated scaffolding and concept mapping with nursing process during the instructional practice in the ward.

3.4 Preparedness was done for 31 nursing students and test critical thinking skills before practicing in the ward (pre test).

3.5 Instructional practice had been conducted according to the manual of strategy to enhance critical thinking for nursing students to integrate scaffolding and concept mapping with nursing process during July 22nd and September 20th, 2013 which was the period of practice for Adult and Elderly Nursing Practicum 1.

3.6 The result of implementation was evaluated for students in order to find out 1) scores of critical thinking skill; 2) scores of analysis over the case study with the application of nursing process; and 3) satisfaction over the strategy. For instructors, satisfaction evaluation over the application of this strategy was conducted.

4. Data Analysis

4.1 Scores of critical thinking skill were analyzed through frequency, percentage, and means. The difference of means of critical thinking skill before and after implementation was analyzed with dependent t test. The level of critical thinking skill was compared by χ^2 which was labeled into 3 levels of percentile (RatanaKomol, 1999)

4.1.1 scores higher than p^{75} represented critical thinking skill as “excellent ” level.

4.1.2 scores among than P^{26-74} represented critical thinking skill as “moderate ” level.

4. 1.3 scores lower than P^{25} represented critical thinking skill as “poor ”level

4.2 Scores of nursing process and analysis the situation in case study were analyzed with frequency and percentage.

4.3 Satisfaction after implementation was judged by frequency, percentage and content analysis.

Step 2 Conclusion on strategies that could enhance critical thinking for nursing study

Researcher concluded the result of implementation on selected strategy and analyzed the difference of critical thinking means scores before and after, scores of nursing process after analyzing case study and satisfaction evaluation after implementing the selected strategy. Report preparation and publication were done respectively.