

CHAPTER III

METHODOLOGY

The researcher has created a plan to arrange learning experience in a subject termed Integrated Local Environment. Its teaching method is focused on the learning process and assisted by certain research tools. The methodology will be described in details as the followings.

Population and Sample Group

Population is the students from Mathayom Suksa 4 and 5 from Regina Coeli College from the first semester in Year 2007 who take the course of their interests. The total number of population is 85 students.

Sample Group is 40 students from Mathayom Suksa 4 and 5; 20 students from each level to make total number of 40 students. All were random by sampled from the population of each level.

Research Tools

The tools that the researcher has produced can be divided into two types, i.e., plan and tools.

Type 1 The Plan for arranging learning experience in local environment is composed of 3 learning units to be delivered in 18 weeks or in 36 periods, with time spent outside the classroom at least 80 hours in one semester.

Type 2 The Tools for collecting data for analysis and the methods of explanation for the research findings are composed as the followings.

2.1 The evaluation forms to measure the acquired level of advanced thinking skills are divided into 3 evaluation forms as the followings.

The first evaluation form is the evaluation form on the students' ability to analyze information. This evaluation form is using 20 items, each of which has five choices.

The second evaluation form is the evaluation form to measure the students' ability to synthesize information in a form of essay writing following certain criteria (Holistic Rubrics) on issues or titles related to the environment.

The third evaluation is the evaluation form to evaluate the capacity of the students to judge the values or qualities of their environments, which is set into 20 items with multiple (five) choices.

2.2 Evaluation form to measure the awareness of the students to their local environment. The researcher has divided the levels of awareness into 5 levels to assess the behavior and thoughts of the students, which are "only slightly correlated to facts," "correlated to facts but just more than slightly," "correlated to facts in moderate level," "correlated to facts rather highly," and "correlated to facts the most."

2.3 The evaluation form to assess the levels of participation in a common learning. This form will be used to observe the students' behavior in group activity participation. The researcher has thus divided the behavior into 5 levels, which are

“no sign of behavior at all,” “little sign of behavior shown,” “moderate level of behavior shown,” “high level of behavior shown,” and “highest level of behavior shown.”

2.4 The evaluation form to measure the levels of cooperation shown by the students in learning. This evaluation form measures the students’ cooperative behavior in shared activities and learning. The researcher divides this behavior into 5 levels of cooperative behavior such as “no sign of behavior at all,” “minimum sign of behavior shown,” “moderate level of behavior shown,” “high level of behavior shown,” and “highest level of behavior shown.”

Creating the Tools for the Study

The researcher has created some tools for the study and classified them into the following types.

Type 1 The Plan for Arranging the Integrated Learning Experience for Local Environment Course.

The researcher has created and tested the quality of the plan using the following methods.

Stage 1: Study on the conditions and the needs of the curriculum as the followings.

1.1 Thorough analysis of demographic data under the curriculum of the Regina Coeli College by five teachers from the courses in sciences (Appendix A, Page 94).

1.2 Analysis of documents or secondary data from studies related to curriculum and learning or studying science such as studies on theory, teaching methods, advanced thinking skills, objectives of the curriculum, the vision of studying science, quality of the learners who study science, learning criteria of the basic education, criteria of learning in each range of class, the learning contents of each range, and expectation from the learning in each semester.

Stage 2: Identification of contents for local environment course and learning experience, which is divided as the followings.

2.1 Thorough study over secondary data or documents resulting from research findings, documents, newspapers, articles, opinions from mass media and the public, and conclusions from open floor discussions. After accumulating this basic information, the researcher brings them to analyze, synthesize, summarize, and set the levels of priority or order for each category of information.

2.2 Brainstorming of five science teachers in attempts to analyze the relationships between the expected results of learning and the learning contents in order to prepare a guiding plan to arrange learning experience in subjects related to local environment deemed appropriate for students studying at grade level 4.

2.3 Presentation of the prepared plan to 3 experts on curriculum and environment subjects (Appendix A, Page 94) in order to check the appropriateness of the contents of teaching materials and gather recommendations for revisions.

2.4 Explanation by the researcher to science teachers on teaching methods, activity arrangement procedures, and the methods to seek knowledge for the students to allow advanced thinking skills, which are experience-based learning

through Project Work, Creative Thinking Learning, Problem-Based Learning, and Self-Directed Learning.

2.5 Brainstorming of five science teachers to synthesize the relationships between the learning contents and the learning methods. The data analysis of the learning contents and the learning activities is presented in Table 1.

Table 1 Learning Contents and Learning Methods in Each Learning Unit

Learning Unit	Learning Contents	Learning Methods	
1 The Wonder of Environmental World	1/1 Ecological System of The World	Ecological system, natural ecological system, type of ecological system, physical factor in the ecological system, relationship of all living things in the ecological system, adaptation of living things and pattern of energy transfer in the ecological system.	<ul style="list-style-type: none"> - Learning by Creative Thinking - Self-directed Learning
	1/2 Miniature of Ecological System	Ecological system in all regions of the world that the student choose to miniature based on the knowledge from the teaching arrangement Plan 1/1.	<ul style="list-style-type: none"> - Learning by Creative Thinking - Problem-Based Learning - Self-directed Learning
2 Local Environment in Chiang Mai	2/1 Local Ecological System in Chiang Mai	Diversity and relationship of all components in ecological system of national parks in Chiang Mai such as Suthep-Pui National Park, Doi Inthanon National Park, Doi Chiang Dao National Park and Muang District of Chiang Mai.	<ul style="list-style-type: none"> - Learning by Creative Thinking - Self-directed Learning
	2/2 Survey of Local Ecological System in Chiang Mai	Local ecological system, Environment and diversity of ecological system in National Park in Chiang Mai such as Suthep-Pui National Park, Doi Inthanon National Park, Doi Chiang Dao National Park and Muang Chiang Mai District which the students choose, based on the knowledge on the learning activity arrangement Plan 2/1 in learning unit 1.	<ul style="list-style-type: none"> - Learning by Project Work - Learning by Creative Thinking - Self-directed Learning

Table 1 (continued)

Learning Unit	Learning Contents	Learning Methods	
3/1 Local Environmental Problems in Chiang Mai	Local environment problems in Chiang Mai such as air pollution, water pollution, garbage disposal, and soil pollution. These problems are composed of the polluted air from forest fire, garbage incineration, cooking, engine exhaust, and unmanageable garbage. Water pollution is related with seasonal floods in rainy seasons. Water in the canals is contaminated with untreated sewage, the soil is polluted with pesticides used in the farming, and the farmlands are contaminated with growth-promoter substances.	- Learning by Project Work - Learning by Creative Thinking - Problem-Based Learning - Self-directed Learning	
3 Analysis of Problems in Order to Develop Local Environment in Chiang Mai	3/2 Managing Local Environmental Problems in Chiang Mai	From the basic knowledge on local environmental problems in Chiang Mai in the teaching arrangement plan 3/1, the students choose certain local environmental problem in Chiang Mai and attempt to solve that local problem.	- Learning by Project Work - Learning by Creative Thinking - Problem-Based Learning - Self-directed Learning
3/3 Developing Local Environment in Chiang Mai	From basic knowledge on local environmental problems in Chiang Mai in the teaching arrangement plan 3/1, the students choose certain local environmental problem in Chiang Mai and attempt to solve that local environmental problem in teaching arrangement plan 3/2 to achieve the sustainable development of local environment in Chiang Mai.	- Learning by Project Work - Learning by Creative Thinking - Problem-Based Learning - Self-directed Learning	

Stage 3: Creation of a plan to arrange learning experience on students' own environment as the followings.

3.1 To make a plan to arrange direct learning experience on students' own local environment by integrating the process-based teaching methods in three learning units scheduled for 18 weeks (or 36 periods with 50 minutes each). Each unit is composed of the plan to arrange learning comprising two or three plans. This learning plan has the components as the followings.

- 1) Objectives of the study
- 2) Contents
- 3) Process to arrange the learning activities
- 4) Teaching Media, equipment, and learning sources
- 5) Evaluations

In each learning unit, there is a guideline for arranging the learning activities by focusing on direct experience and integrating learning focus on processes called “Project Work,” “Creative Thinking Learning,” “Problem-Based Learning,” and “Self-Directed Learning.” Each plan has the activity arrangement that is appropriate to the contents of at least two methods out of these four methods that focus on the process. The plan to arrange learning activities of each plan is assigned in code with a notation of “Number/ Number.” The number in front and the back have the meanings as the followings.

“Former number/” means the number of the learning unit of the whole sets of learning plans.

“/Latter number” means the order of the plan of learning activity arrangement in that unit.

The time spent on the teaching will be divided into categories of “inside the classroom/period” and “outside the classroom/period.” The meanings for these categories are given as the followings.

“Inside the classroom/period” means the period set for the subject in each week by following the school’s learning schedules.

“Outside the classroom/period” means the time when a teacher working with the students set sessions for studying or doing activities outside the normal class schedules.

3.2 To present the plan to a board committee and 3 experts (Appendix A, Page 94) to check its appropriateness.

3.3 To revise the plan which composed of three learning units which is presented in Table 2.

Table 2 The Titles and the Contents for Each Learning Unit

Learning Unit	Time of study (hours/weeks)		Total (weeks)
	Inside the period	Outside the period	
1 The Wonder of Environmental World	1/1 Ecological System of The World	6/3	5
	1/2 Miniature of Ecological System	4/2	
2 Local Environment in Chiang Mai	2/1 Local Ecological System in Chiang Mai	4/2	5
	2/2 Survey of Local Ecological System in Chiang Mai	6/3	
3 Analysis of Problems in Order to Develop Local Environment in Chiang Mai	3/1 Local Environmental Problems in Chiang Mai	4/2	8
	3/2 Managing Local Environmental Problems in Chiang Mai	8/4	
	3/3 Developing Local Environment in Chiang Mai	4/2	

Type 2 Tools for Data Collection and Analysis of the Study Results.

1. The evaluation form to measure the achieved advanced thinking skills among the students.

Creation or invention of the evaluation form for the levels of advanced thinking skills achieved by the students is used to measure their ability to think in an advanced level after a Learning Unit is accomplished. The researcher thus builds three evaluation forms. The procedures of their production are shown as the followings.

The first evaluation form to evaluate students' ability to analyze information.

1. The insights on how to make evaluation forms for intelligence have been following the propositions of Benjamin Bloom on ascending order of levels of knowledge and how to mark each level's acquisition.

2. The identification of evaluation form for ability to analyze is done by dividing the data or the whole picture of the local environment into small parts and then rearranging these small parts of information into categories according to certain criteria that enable perception and understanding of the relationships of all parts of information. There are original 28 items incorporated within the evaluation form. The following is just an example.

(0) "Chiang Mai people jointly renovated the Temple of Wat Lok Mori in order to recreate social harmony and societal attachments like they had in the past." This statement reflects the awareness of Chiang Mai people in what aspect? (Analysis of Relationships)

- A. Preservation of a heritage.
- B. Showing off affiliation to the King.
- C. The practiced belief of the people to the Temple.
- D. Conservation of the ancient artifacts kept in the Temple.
- E. Continuation of the faith to the sacred things and the Temple.

3. Check the correctness and the precision of the contents by assistance of a board committee and the experts (Appendix A, Page 95) to judge and agree the level of reliability of the form to measure the students' ability to analyze information.

4. Incorporate the suggested improvements of the experts' judgment into the tried set of questionnaires and then calculate the means of the scores and then select the final 25 items with the levels of item reliability standing more than 0.8.

5. Prepare the revised version of the evaluation form according to the advice of the experts and prepare a complete set.

6. Bring the evaluation form for a test with 100 grade level 4 students at Regina Coeli College in year 2007. In order to perform the item analysis (i.e. degree of difficulty and discrimination power), the study utilizes the method that compares 27% of individuals with highest scores and 27% of individuals who have the lowest scores (27% of highest score group - 27% of lowest score group). The measured degree of difficulty stands between 0.21 and 0.77 and the discrimination power is calculated between 0.14 and 0.78.

7. Select the items with degrees of difficulty level standing between 0.20 and 0.78, and then select 20 of such items to prepare a complete set.

8. Bring the completed evaluation form to launch the second test among grade level 4 students year 2007 (150 students) who are not the sample group

of the study in order to find the reliability of the evaluation form by using the Kuder-Richardson method (1937). The calculation for the reliability of this evaluation form produces a level of 0.86.

The second evaluation form on ability to synthesize information.

1. The guidelines on how to make the evaluation form for intelligence-related capabilities have been following the propositions of Benjamin Bloom about the ascending order of level of knowledge and how to mark each acquisition in individuals.

2. The identification of designs, styles, and construction of the evaluation form for students' ability to synthesize information are done through integration of creative and original thinking about proper solutions for environmental problems. The students' capability to perceive and imagine the whole picture of the environment situation is thus divided into 5 levels in each item of measurement.

3. The correctness and precision of the evaluation form contents are tested by a board committee and the experts (Appendix A, Page 95). They judge and approve if this evaluation form measures accurately the students' ability to synthesize information.

4. The revision on the evaluation form based on the experts' advice is calculated and the calculated means of scores stand at 1.00.

5. The improved evaluation form based on the experts' advice is tested with 10 students of grade level 4 year 2007 who are not the sample group of the study in order to calculate the levels of reliability and the Intra-Class Coefficient (the item reliability of this evaluation standing at 0.82).

The third evaluation form on students' ability to evaluate information.

1. The insights on production of the evaluation form for intelligence-related ability to evaluate information have been similarly taken from the propositions of Benjamin Bloom on the ascending order of levels of knowledge and how to mark each acquisition per individual.

2. The evaluation form is designed to measure students' ability to evaluate information in judging the values or qualities of their own environment. The results of the students' judgment are compared with the identified criteria, including certain criteria to assess the logical appropriateness of thought and performance (set in 26 items). An example of item is given below.

(0) Does garbage burning belong to environmental-friendly methods of waste management? (Evaluation by Using External Criteria)

A. No because it may cause fire.

B. No because it causes toxic smoke.

C. No because the burning produces ash.

D. Yes because garbage is sources of diseases.

E. Yes because it reduces the amount of garbage.

3. The correctness and precision of the contents of the evaluation form are tested through involvement of a board committee and the experts (Appendix A, Page 95). These experts judge and approve whether or not the evaluation form really measures the ability to evaluate information correctly.

4. The results of the committee judgment are calculated further to find the means and then the final 25 items with the levels of reliability higher than 0.8 are selected. The means of scores for the trial of this improved questionnaire stand between 0.80 and 1.00.

5. Revision according to the experts' suggestions is launched to produce a complete set of evaluation form.

6. The completed evaluation form is prepared for the first test with 100 students from grade level 4 at Regina Coeli College in year 2007. In order to launch item analysis (to measure the degree of difficulty and discrimination power), the study uses a method that compares 27% of individuals with highest scores and 27% of individuals who have the lowest scores (27% of highest score group - 27% of lowest score group). The degree of difficulty is found to stand between 0.21 and 0.79 and the discrimination power is measure at between 0.10 and 0.78.

7. Selection of the items with degrees of difficulty ranging between 0.20 and 0.80 is done and 20 items with the discrimination power higher than 0.20 is selected to prepare a complete set of evaluation form.

8. Preparation of the completed evaluation form is accomplished to launch the second test among the grade level 4 students year 2007 (150 students) who are not members of the sample group of the study in order to find the reliability of the evaluation (with Kuder-Richardson method). The reliability of the evaluation form calculated after this second test is 0.88.

2. The evaluation form to measure the levels of awareness among the students to their environment.

Production of an evaluation form is undertaken to measure the students' awareness to the local environment after a class has finished. The procedures of this endeavor are elaborated as the followings.

2.1 Study on the concepts and theories related to the students' awareness of their own local environments and study the known processes to make a proper evaluation form to assess this awareness.

2.2 The design of an evaluation form for students' awareness to the local environment (25 items) is divided into 3 parts: (1) Students' awareness to the local environments (10 items) which are items 3, 4, 5, 8, 11, 14, 17, 20, 21 and 24, (2) Self-conduct to local environments (13 items) which are items 1, 2, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19 and 22, and (3) Achievements in self-conduct to the local environments (2 items) which are items 23 and 25. These items are settled into 11 positive statements in items 1, 2, 5, 7, 9, 10, 13, 15, 18, 20, and 22, and 14 negative statements in items 3, 4, 6, 8, 11, 12, 14, 16, 17, 19, 21, 23, 24, and 25.

2.3 Trial of the students' awareness form in a test with 20 grade level 4 students in year 2007. Then the weaknesses and achievement of each item are discussed to find suggestions for its improvement. Advice on the language use is also sought that the form becomes simple and easy to understand for more accurate questionnaire. The evaluation form is the presented to a board committee and the experts (Appendix A, Page 95) to check the correctness and precision of its contents. The tested and measured levels of correctness and precision by the experts are taken for further revision. The study then adopts the items with the levels of item reliability higher than 0.8 (the means of this reliability level ranging between 0.08 and 1.00).

2.4 The revised version of the evaluation form to measure the students' awareness to their local environment is prepared in a complete set.

2.5 The researcher tests this revised evaluation form for levels of students' awareness of their local environments on grade level 4 students (100 students) from year 2007 who are not the intended sample group of this study. The results are analyzed to get the discrimination power in each item with the technique of 25 percent of high score group and 25 percent of low score group and the calculation of the t-test (scores ranging between 2.039 and 7.541), the selection of 0.05 (5 percent) as the statistical significance level, and then improvement for the items with low discrimination powers. These steps finally gather 25 items to complete the improvised set.

2.6 The researcher tests this revised evaluation form for levels of students' awareness of local environment on grade level 4 students (100 students) from year 2007 who are not the sample group of the study to calculate the form's reliability and its Cronbach- α (reliability coefficient). The result of the calculation for level of reliability is 0.74.

3. The observation/evaluation form on the students' cooperative behavior in learning sessions.

Creation of this observation form on the students' cooperative behavior in learning is necessary to measure the levels of cooperation shown by the students during class sessions. The procedures for making this form are explained below.

3.1 Thorough study on the available data about student's cooperative behavior during the class as well as study on procedures to make observation form this behavior in learning.

3.2 The design of the observation form is set in 15 statements (or 15 items) which can be classified as (1) Participation in group activity on expressing opinion on 4 items (items 1, 2, 3, and 10), (2) Listening and accepting opinion on 2 items (items 4 and 6), (3) Willingness to work on their assignments happily on 4 items (items 5, 7, 8 and 9), and (4) Helping one another on 5 items (items 11, 12, 13, 14, and 15).

3.3 The researcher submits this observation form to measure the levels of students' cooperative behavior during learning sessions to the members of Thesis Board Committee and the experts (Appendix A, Page 95) to probe the correctness and precision of its contents. A revised version of the observation form is later set by using the criteria of experts' advice with the means of discrimination power values higher than 0.80 (between 0.80 and 1.00).

3.4 The revised version of the observation form on the students' cooperative behavior during learning is reproduced into a complete set.

3.5 The evaluation form for levels of students' cooperation in learning is tested with six sample groups of students and 2 sciences teachers in order to find the form's quality and reliability by measuring the Intra-Class Coefficient ($r_{i(c)}$). The calculation shows the level of reliability as 0.87.

4. The self-evaluation form to measure the levels of cooperative behavior among the student in learning sessions.

Creation of this evaluation form of self-evaluation form on cooperative behavior in learning is important to measure the levels of students' cooperative

behavior in the group during class sessions. The procedures for making this form are given as the followings.

4.1 Thorough study on the available data concerning student's cooperative behavior on learning as well as the known studies on procedures to make a students' self-evaluation form on cooperative behavior during learning.

4.2 The design of the self-evaluation form is set in 25 statements (or 25 items) classified as (1) Participation in group activity on expressing opinions in 5 items (items 1, 2, 3, 4 and 5), (2) Listening and Accepting opinions of group members on 6 items (items 6, 7, 8, 9, 10 and 11), (3) Willingness to work on assignment voluntarily on 5 items (items 12, 13, 14, 15, and 16), and (4) Helping one another on 9 items (items 17, 18, 19, 20, 21, 22, 23, 24 and 25).

4.3 Trial of this observation form to measure the levels of student's cooperative behavior during learning sessions with some 20 students of grade level 4 in year 2007 then discussion about the weaknesses of the evaluation form in each item. Suggestions are also sought on the language use so the form becomes simple and easy to understand for correct responses. Afterward the form is submitted for revision by the members of Thesis Board Committee and the experts (Appendix A, Page 95) to probe the correctness and precision of its contents. A revised version of observation form is set by using the criteria of experts' advice with the average of reliability values higher than 0.80 (standing between 0.80 and 1.00).

4.4 The revised version of the student's self-evaluation form on cooperative behavior during learning is prepared to be a complete set of student's self-evaluation form.

4.5 The researcher tests the student's self-evaluation form with the students from grade level 4 (100 students) of year 2007 who are not parts of the sample groups. The findings are analyzed for the values of discrimination power in each item with the technique of 25% high score group and 25% of low score group (then calculation for the statistical significance levels using the t-test gathers the t-score ranging between -2.283 and 9.335). The selection is made for items with statistical significance lower than 0.05 and the revision is made on the items with low scores on discrimination power. Some final 25 questions are thus selected to complete the evaluation set.

4.6 The researcher tests the student's self-evaluation form with the students from grade level 4 (100 students) of year 2007 who are not the sample groups in order to calculate the reliability of its contents (in Cronbach- α coefficient). The result of calculation shows the form's reliability in Cronbach- α coefficient as 0.91.

Data Collection

The researcher sets experiment and collects the measured data in the following manners.

1. The researcher secures the permission to test the "Local Environment" curriculum for the first semester in year 2007 from the manager and the Principal of the Regina Coeli College.

2. The study arranges the implementation plan to arrange the experience-based learning in a course called "Local Environment" with the students taken as

samples for 18 weeks. The total period of the course is 36 hours inside normal hour of classroom, and at least 80 hours outside of the classroom.

3. During the implementation of the plan to arrange the experience-based learning, the study measures the acquired levels of advanced thinking skills (on three aspects) for 11 times, measures the levels of students' awareness to their local environment for 6 times, observes the students' cooperative behavior during learning for 6 times, and allows the students to self-evaluate their levels of cooperative behavior in learning for 3 times.

4. The researcher measures the levels of acquired advanced thinking skills and the levels of awareness to students' local environment again after the accomplishment of all three units of implementation of the plan.

The study procedures can be shown as the following Diagram.

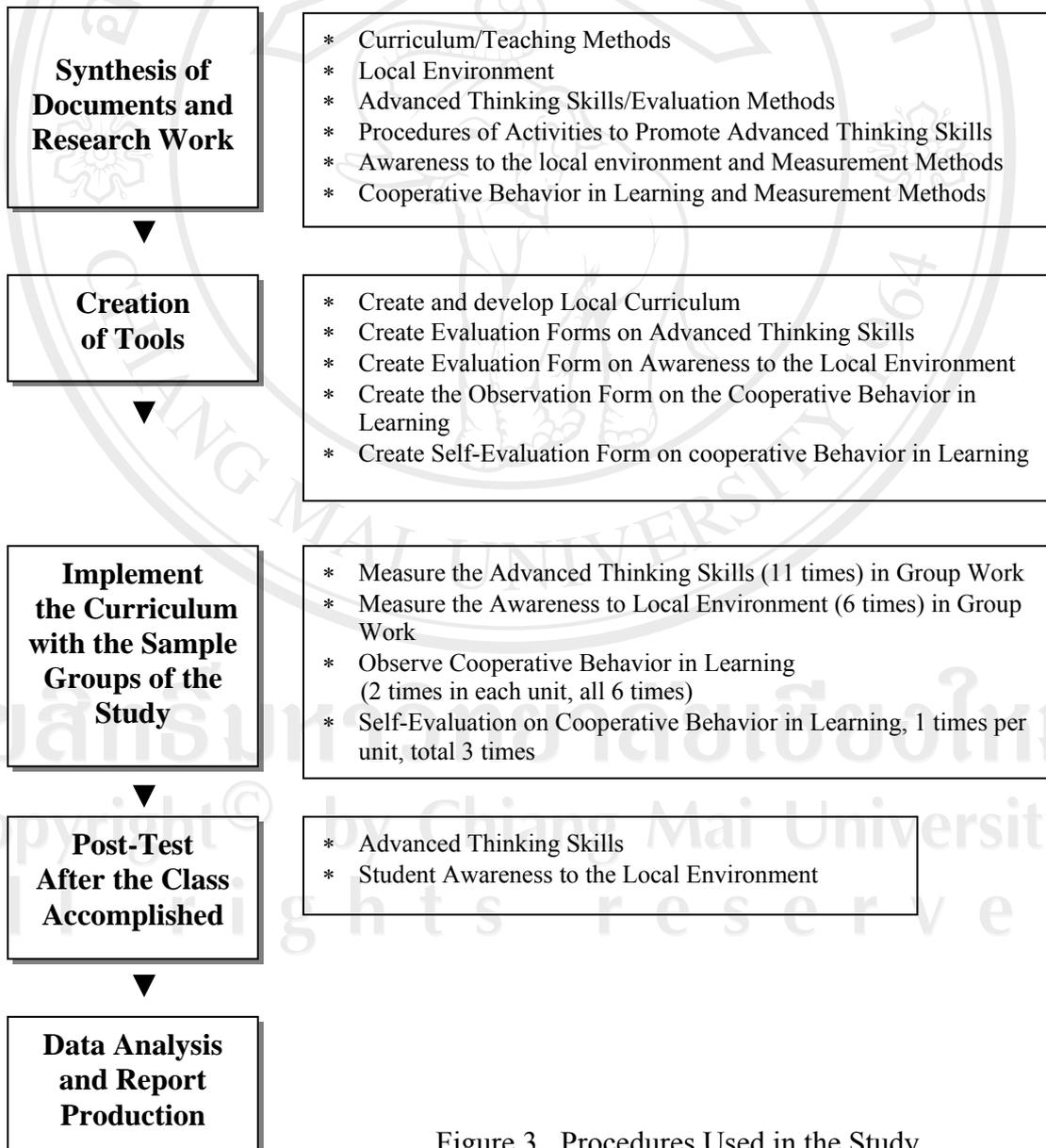


Figure 3 Procedures Used in the Study

Data Analysis

The researcher analyzes the data in the following manners.

1. Calculation of the content validity of all tools by using the judgment of the experts who measure the reliability values of higher than 0.80.
2. Measurement of the degree of difficulty and discrimination power of the evaluation form on the analysis and evaluation by using the 27% high score group - 27% low score group method.
3. Calculation of the discrimination power of the evaluation form on students' awareness to the local environment and self-evaluation form on cooperation in learning by using the method of 25% high score group - 25% low score group before the T-scores are measured with t-test.
4. Establishment of the reliability value of the research tools which can be divided into three groups as the followings:
 - Group 1: Measurement of the reliability by using the Coefficient of Alpha using a computer program. This group of tools is composed of the evaluation forms of students' awareness to local environments and the self-evaluation form on cooperative behaviors in learning.
 - Group 2: Measurement of the reliability by using the Intra-class Coefficient with a computer program. This group of tools is composed of the evaluation form on ability to synthesize information (advanced thinking skills) and the observation form for the cooperative behavior in learning.
 - Group 3: Calculation of the reliability by using the formula of Kuder Richardson (KR20) by using the EVANA Program of Kochan Thongkham (1999). This group of tools is composed of the evaluation form on Analysis and other evaluation forms.
5. Analysis of data is done with the basis statistical methods such as means, standard deviations and a computer program.

Data Interpretation

The data is interpreted and analyzed accordingly in each aspect following the identified criteria as the followings.

1. The levels of acquired advanced thinking skills are calculated from the students' Project Work and the students' replies in the evaluation form that measures the students' ability to analyze, synthesize, and evaluate information.

The students' scores on Project Work are compared to the criteria of the advanced thinking skills that the researcher has set at the minimum of 70% of full score. The actual results show that the levels of students' advanced thinking skill are higher than the acknowledged criteria of External Quality Assessment, Basic Education Round 2 (B.E 2549-2553) under The Office for National Education Standards and Quality Assessment (Public Organization) (ONESQA) (2005: 31-32). To measure the levels of students' advanced thinking skills, the study applies 4 levels as the followings:

Numbers of Students with Desired Characteristics (Score at the minimum of 70%)	Meaning
higher than 90%	Very good
between 75-89%	Good
between 50-74 %	Fair
lower than 50%	Need Improvement

2. The levels of student's awareness to their local environment can be extrapolated from their answers in the evaluation form on the awareness to the student's local environment after the class sessions. The scores are given according to the characteristics as the followings.

Awareness Level	Positive Statement Score	Negative Statements Score
Not accurate to the facts	0	4
Correct to facts, but a little	1	3
Correct to facts, moderately	2	2
Correct to facts, rather highly	3	1
Correct to facts, the most	4	0

After a proper consideration of the students' scores from their Project Work, an interpretation the results, and an analysis of the means of the scores, the researcher then identifies the criteria as the followings.

Score Means	Meaning
3.51 - 4.00	The awareness is at the highest level.
2.51 - 3.50	The awareness is at a rather high level.
1.51 - 2.50	The awareness is at a moderate level.
0.51 - 1.50	The awareness is at rather low level.
0.00 - 0.50	The awareness is lacking.

3. The levels of students' cooperative behavior in learning sessions can be observed through their behavior during their participation in group activities. There are five levels within the criteria of the evaluation as the followings.

Level of Cooperative Behavior	Meaning
4	Highest level of behavior is detected.
3	Rather high level of behavior is detected.
2	Moderate level of behavior is detected.
1	Little sign of behavior is detected.
0	No such behavior is detected.

The interpretation

Analysis of the means leads the researcher to identify the criteria as the followings.

Mean	Meaning
3.51- 4.00	Have highest level of cooperative behavior in learning.
2.51- 3.50	Have quite high level of cooperative behavior.
1.51- 2.50	Moderate level of cooperative behavior in learning.
0.51- 1.50	Rather low level of cooperative behavior in learning.
0.00- 0.50	Lack of cooperative behavior in learning.

4. Cooperative behavior in learning can be observed the self-evaluation form of the students in their participation in group activities. The criteria have been set at five levels of behavior as the followings.

Behavior Level	Meaning
4	Maximum level of behavior in the statement.
3	Rather High level of behavior in the statement.
2	Moderate level of behavior in the statement.
1	Low level of behavior implied in the statement.
0	No behavior implied in the statement.

Interpretation

From the analysis of the means (\bar{X}), the researcher has identified the criteria as the followings.

Means	Meaning
3.51- 4.00	Highest level of cooperative behavior in learning.
2.51- 3.50	Rather high level of cooperative behavior in learning.
1.51- 2.50	Moderate level of cooperative behavior in learning.
0.51- 1.50	Rather low level of cooperative behavior in learning.
0.00- 0.50	Lack of cooperative behavior in learning.