

CHAPTER THREE

METHODOLOGY

This chapter explains the research design in this study organized by

- 3.1 The subjects
- 3.2 The materials
- 3.3 The procedures used in the collection and analysis of the data
- 3.4 The data analysis

3.1 SUBJECTS

Population

In year 2007, the number of Thammasat University's students was 34,295 (Thammasat University, 2007) classified by educational level as follows:

| | |
|-------------------|---------------|
| Bachelor's degree | 25,954 |
| Graduate Diploma | 541 |
| Master's degree | 7,486 |
| Doctoral degree | 314 |
| Total | <u>34,295</u> |

Sampling

The formula of Taro Yamane was used to calculate the sampling size (Pencare, 1997)

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

n = size of sampling

N = population (in this study, 34,295 persons)

e = error of the random sampling (in this study set as 5 percent)

The sample size of the study is therefore n = 396 persons

The researcher calculated the number of respondents of each education level by using the Proportional Stratified Random Sampling method as follows.

The number of respondents at each education level

$$= \frac{\text{number of respondents} \times \text{size of population of each education level}}{\text{size of the population}}$$

Table 1 Population and Respondents at Each Education Level

| Education level | population | sampling |
|-------------------|---------------|------------|
| Bachelor's degree | 25,954 | 300 |
| Graduate Diploma | 541 | 7 |
| Master's degree | 7,486 | 87 |
| Doctoral degree | 314 | 4 |
| Total | 34,295 | 398 |

3.2 MATERIALS

The questionnaire developed as an instrument for data collection in this survey is divided into 3 main parts. **Part 1** consists of 2 close-ended questions and 1 open-ended questions on personal information: gender, age, and education level. **Part 2** consists of 44 close-ended questions used to measure students' knowledge of the situation of electricity in Thailand, knowledge of units of electricity and electrical equipment, knowledge of the Demand Side Management program (DSM), and knowledge of how to choose, use, and maintain electrical equipment. If students mark the right answer they gain a score of 1 and if students mark the wrong answer they gain a score of 0. **Part 3** consists of 5 open-ended questions used to examine students' suggestions on the development of energy saving programs.

The knowledge of electricity energy saving was analyzed by Mean and Standard Deviation. The knowledge was classified into 3 levels as follows.

| | | | |
|------------|------------------------------|---|--------------------------|
| Lower than | $\bar{x} - 1 \text{ S.D.}$ | = | Low knowledge level |
| | $\bar{x} \pm 1 \text{ S.D.}$ | = | Moderate knowledge level |
| More than | $\bar{x} + 1 \text{ S.D.}$ | = | High knowledge level |

3.3 PROCEDURES

3.3.1 Research Design

The Proportional Stratified Random Sampling method was the sampling procedure used in this study. The participants in this study were 398 students of Thammasat University who studied in the year 2007 and were able to provide the information to achieve the objectives of the study.

3.3.2 Data Collection

In order to make the survey reliable and practical, the researcher reviewed literature from the thesis of Mr. Thammachart Suebsinskulchai. The researcher applied the knowledge from this study to develop a self-administered questionnaire. After the questionnaire had been created, it was verified again by Mr. Thammachart for accuracy.

The researcher collected data from specific groups of students who were asked to answer the questionnaire by themselves. The data collection for this survey took 2 months from December 2007 to January 2008.

3.4 DATA ANALYSIS

The data gained from the respondents were analyzed by using SPSS program (Statistical Package for the Social Science) version 10.0 for statistical analysis. Basic statistics were used in the data analysis such as Percentage, Mean, and Standard Deviation, T-Test, and One-way ANOVA.

The statistical devices used in this study to test the research hypotheses were as follows:

- 1. Frequency Distribution and Percentages** were used to analyze the sample's demographics such as gender, age, and education levels.

2. Arithmetic Mean and Standard Deviation were used to calculate the average level of the students' knowledge of the electricity situation in Thailand, knowledge of units of electricity and electrical equipment, knowledge of the Demand Side Management program (DSM), and knowledge of how to choose, use, and maintain electrical equipment.

3. T-test Scores were used to find out the relationship between students' gender and the knowledge level of electricity energy saving.

4. One-Way ANOVA was used to find out the relationship between students' ages, education levels and the knowledge levels of electricity energy saving.

In summary, this chapter illustrated the methodology of this research concerning subjects, materials, procedures, and data analysis. In the next chapter, the research results are presented.