

## CHAPTER 3

### RESEARCH METHODOLOGY

This chapter explains the procedures that the researcher used to conduct the study. This includes the characteristics of the population, and the instrument used in the data collection procedure. The construction and development of the questionnaires and the statistical analysis are also explained in this chapter.

#### 3.1 Research Design

This study aimed to identify the English language skills deficits of Thai medical technologists and to assess their needs and preferences for an EMTP training course. In order to achieve this objective, this study adopted the qualitative and quantitative designs. Both qualitative and quantitative research designs are useful tools for analyzing the collected data. The data (both questionnaire and interview) was collected from 32 Thai medical technologists. A questionnaire was used for identifying the challenges they face as a result of English language skills deficits and the workplace situations that present the greatest and most frequent difficulties. The interview was used to determine their motivations and preferences regarding EMTP training. In short, the quantitative design can answer questions by using statistics and other mathematical procedures. Whereas, the quantitative research seeks to validate a theory by analyzing the results numerically, the qualitative research seeks to arrive at a theory that explains the behavior observed. In this way, it can be said that the quantitative research is more deductive and qualitative research is more inductive.

Moreover, previous research studies on areas of background research and information that are necessary for understanding the present study. This information is useful for understanding the population of interest in the study. Therefore, a mixed research design is the most appropriate for the purpose of this study.

### 3.2 Population and Participants

#### 3.2.1 Population

The population of the study comprised all medical technologists who worked at laboratory departments in the hospitals which located in Pattaya city, Thailand.

#### 3.2.2 Participants

There were 32 medical technologists chosen from the hospitals namely: Pattaya International Hospital, Bangkok Pattaya Hospital and Pattaya Memorial Hospital. One government hospital: Banglamung Hospital, All participants were selected by purposive sampling technique shown in Table 3.1

**Table 3.1**

**The Participants of the Study Classified by Hospital**

	Hospital				Total
	Pattaya International	Bangkok Pattaya	Pattaya Memorial	Banglamung	
<b>Participants</b>	6	8	6	12	<b>32</b>
<b>Percentage (%)</b>	18.75	25	18.75	37.5	<b>100 %</b>

### **3.3 Research Instruments**

The method of the data collected employed in this study were questionnaires and semi-structured interviews. The research instruments used in this study were classified under following two headings:

Research instrument used in this study was a questionnaire which was designed to help gather data concerning the needs and problems that medical technologists had when using English. The questionnaire included three parts, namely a checklist, a 5-rating scale, and also an open-ended form for comments.

The questionnaire was written in Thai in order to minimize problems of ambiguity and misinterpretation. To ensure the validity of the questionnaire, the draft version of the questionnaire had been modified and revised based on the suggestions of the thesis advisors, two English instructors and one statistics expert.

A pilot study was run in order to test the effectiveness of the questionnaire and improve the language appropriateness of the questions. The subjects of the pilot study were asked to fill out the questionnaire, and then to comment on its content and wording. They were be given the opportunity to make suggestions on questions they think should be added or removed. Finally, the questionnaire was revised with these suggestions taken into account before the final version was delivered to the 32 medical technologists who were within the target group. To ensure the reliability of results, Cronbach's alpha coefficient was calculated.

### 3.3.1 Questionnaire

The questionnaire used in this study consisted of 4 parts. It was specifically designed to obtain the following information:

The first part was designed to obtain biographical information about the subject: age, position at work, place of work, their level of education, and also their time spent working as a medical technologist.

The second part was intended to obtain medical technologists' opinions about their problems in using different English language skills (listening, speaking, reading and writing) in their professions.

The third part was aimed to obtain the medical technologists' opinions about their needs (solutions to their problems) in using different English language skills (listening, speaking, reading, writing and translation) in their profession. All questions in parts of medical technologists' opinions about their problems and needs in using different English language skills were built on the basis of the process of performance and tasks of hospital medical technologists in general. After reviewing descriptions of work conditions and the nature of work, the questionnaire was written by integrating the basic areas - clinical laboratory, outpatient dispensing, admitted-patient dispensing, laboratory, working with physicians and other colleagues in health care. The information from these two parts could help to determine the level of correlation between the nature of work and their use of English.

The last part, The forth part was about the medical technologists' opinions and their desires concerning possible English syllabus, content, skills, and time for learning English, needs and problems of medical technologists both academically and professionally.

### **3.3.2 Construction and Development of Questionnaire**

As the subjects were Thai medical technologists, the questionnaire used in this study was written in Thai in order to minimize any problems that might arise due to lack of clarity and word misinterpretation. Below is the outline of how the questionnaire was developed.

Firstly, the researcher reviewed the research and literature related to English for specific purposes (ESP). The researcher also reviewed the needs analysis, the syllabus designs and the job analysis of medical technologists before drafting the questionnaire.

Secondly, the draft questionnaire was written based on the job description for a medical technologist and also the definition of the role of a medical technologist as defined in The Medical Technology Council book (2006). The draft questionnaire was constructed in relation to the purposes of the study, and the research questions covered the following aspects:

1. The needs and problems of medical technologists in Using English in their professions.
2. The subject contents and skills in English which were important to develop medical technology work.
3. The medical technologist's wants concerning the English course, contents, time and skills.

### 3.3.3 Validity and Reliability of the Questionnaire

To ascertain validity, the questionnaire was developed based on existing literature and research reviews. The draft questionnaire was revised, based on the suggestions of the thesis advisor and four English language experts. It was then try out in a pilot study. After that, the questionnaire was analysed for its reliability by a computer program SPSS, using the Alpha Coefficient Formula or Cronbach Formula using the alpha reliability coefficient of the questionnaires was 0.738. The test showed a modest degree of reliability as Garson (1998 : 2) Cronbach's alpha coefficient should be at least .70 or higher to retrain an items in an "adequate" scale. By using the pilot study as a research device, the researcher was able to obtain information relevant to the design and of the validity of the questionnaire before it was finalized to be used with the target subjects of the study. It was administered to ten medical technologists at Ake Chol Hospital, Chonburi Province. These ten medical technologists were not in the main target group of the study. During the pilot, these medical technologists were asked to answer the questions and comment on the questionnaires' content and terms. They were asked to express any other opinions concerning the use of English in their occupation. Finally, the questionnaire was analyzed for its reliability using a piece of statistics computer software called SPSS, using Cronbach's Alpha Coefficient Formula to determine the alpha reliability coefficient of the questionnaire.

The draft questionnaire was constructed in relation to the study, and the research questions covered the following topics:

1. To what extent do medical laboratory technologists need English for their work?
2. What problems do medical laboratory technologists face in using English?

### **3.3.4 Semi- Structured interview**

For structured interview, it was conducted to gather information, being left unanswered in questionnaire, which gains a lot of recommendations. The interviewees were gained by interview, which helped interviewees felt more comfortable which reflected to getting more information.

### **3.4 Data Collection**

After sending the official letter to request for permission and cooperation to gather the data, the research questionnaires were distributed to the target subjects in each hospital in Pattaya city. The researcher collected the data by herself. The questionnaire was administered during the period of May - July 2011.

After the pilot study was completed, the questionnaires was revised and the questionnaire package was made to include:

- 1) A cover letter from the Dean of Graduate School, Buriram Rajabhat University, asking for co-operation in completing the questionnaire and returning of the questionnaire.

- 2) A copy of the questionnaire.

All copies of the final questionnaire were distributed by the researcher herself to the 32 hospital medical technologists among 3 private hospitals in Pattaya area during a two - month period in May 2011. The researcher collected all the completed questionnaires herself.

- 3) For conducting semi - structured interview, the researcher endeavoured to find out their reasons why they were interested in EMTP course.

It focused on respondents' interest in EMTP courses and to ascertain the researcher to their responses, which conducted after finishing their answers on questionnaires. The interviewer briefed the respondents the purpose of the interview to attempt to make the respondents felt at ease without using tape recorder.

4) Moreover the interviewer clarified any misunderstanding which may cropped up in the interpretation of the questions and followed up any avenue of interest which arose during the question and answers session but which had not been for seen during the designing of the semi-structured interview.

### **3.5 Data Analyses and Statistical Procedures**

#### **3.5.1 Effectiveness of the Research Instrument**

To ascertain validity, the questionnaire was developed on the basis of literature and research reviews. The draft questionnaire was then modified and/or revised, based on the suggestions of the thesis advisors and four experts in the research conduction field. It was then tried out in a pilot study.

To ensure the reliability of the questionnaire, Cronbach's Alpha Coefficient was employed to check the consistency of answers for items which are used a five – point Likert scale.

Cronbach's Alpha Coefficient was employed to finalize the reliability of the responses of the informants in the part where a five-point scale is ranked for each item.



### 3.5.2 Statistical Method Used

After checking the completion of each questionnaire, a software package - "Statistical Package for the Social Sciences" (SPSS) was used to analyze the data. The statistical devices employed in this study were as follows:

1) Cronbach's Alpha Coefficient used to calculate the reliability of the questionnaire answers. The result of Cronbach's Alpha Coefficient is presented in Table 3.2

**Table 3.2**

#### Reliability Test

Variables	Items	Cronbach's Alpha
Listening skills	7 items (2.1-2.7)	0.727
Speaking skills	5 items (3.1-3.5)	0.736
Reading skills	11 items (4.1-4.11)	0.725
Writing skills	8 items (5.1-5.8)	0.740
Translation skills	3 items (6.1-6.3)	0.687

Source : Bryman & Bell (2007 : 215).

The result showed that all items are reliable and understandable as the Cronbach's Alpha score indicated more than 0.6 (Bryman & Bell. 2007 : 215).

2) A 5-point Likert scale used to score the levels of the English needs, English use, and problems when using English based on the following criteria:

**Table 3.2****A 5 – Point Likert Scale**

Scale	Importance	Problem	Need	Mean range
5	Very important	Mostly Problematic	Always need	4.20 – 5.00
4	Just important	Moderately problematic	Strong need	3.40 - 4.19
3	Moderate important	Problem sometimes	Moderate need	2.60 - 3.39
2	Slight important	Slightly problematic	Little need	1.80 - 2.59
1	Not important at all	Not a problem at all	No need at all	1.00 -1.79

**Source :** Yilmaz, Altinkurt and Kalfa (2013) ; Vagias (2006).

3) Mean ( $\bar{X}$ ) and Standard Deviation (S.D.) were used to calculate the average level of English needs and problems faced by medical technologists. The higher mean score of each activity reflects the specific needs, uses, and problems in English for medical technologists when doing that individual activity. The lower mean score shows the needs, uses, and problems of that activity, standard deviation value depicts the spread or dispersion of the scores within each group of respondents.

$$\text{mean} = \bar{x} = \frac{\sum_{i=1}^n x_i}{n}$$

where  $\bar{x}$  (read as 'x bar') is the mean of the set of  $x$  values,  
 $\sum x$  is the sum of all the  $x$  values, and  
 $n$  is the number of  $x$  values.

$$SD = \sqrt{\frac{\sum (x_n - \bar{x})^2}{n-1}}$$

where:

- $\bar{x}$  = mean (average) of the QC values
- $\sum (x_n - \bar{x})^2$  = the sum of the squares of differences between individual QC values and the mean
- $n$  = the number of values in the data set

### 3.6 Summary of the Chapter

Chapter three explains the procedures of the study, construction and development of the questionnaire, the validity and reliability of the questionnaire, and the analysis of the data. The results of the study are reported in the next chapter.