

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter explains how the project paper which investigated teaching methods using Information and Communications Technologies (ICTs) to promote higher order thinking skills was carried out. The investigation was carried out by using the survey method. A questionnaire that sought responses that were in the form of check lists as well as open-ended responses were used. The questionnaire was designed so as to derive answers to the research questions outlined in Chapter 1.

3.2 Subjects

The subjects for this project paper were 50 secondary school teachers who are computer literate. These teachers were pursuing a part time course in Masters in Education at the University of Malaya majoring in Educational Technology. In this course these teachers have been exposed to the Internet and they have an Internet account either at home or at the University. They use computers to complete assignments and surf the Internet to do research. They have also done papers on Multimedia Production and Instructional Design. Therefore these teachers can be considered as computer literate.

At the same time all these teachers are teaching in day schools. Their job requires them to interact with secondary school students. They teach subjects they are specialized and trained in.

The reason for this choice of sample is that all these teachers are aware of the capabilities of ICTs and at the same time have the opportunity to use various teaching

methods in their classrooms. Thus, it was assumed that they would be able to make valid responses to the questionnaire.

3.3 Instrument

A questionnaire consisting of six sections was used to collect data (See Appendix A). The researcher designed the questionnaire in accordance to the needs of the research questions. The items were constructed based on observations of teaching methods used in schools through the experience of the researcher as a schoolteacher as well as ideas taken from the literature review (Chapter 2).

3.4 Structure of the Questionnaire

Section One of the questionnaire requested for demographic information of the respondents. They were requested to write the name of the school they were teaching in and state the subjects they were teaching in school. In addition they were asked the number of years they have been teaching. This information was to confirm their position as a schoolteacher.

Section two was designed to find out the teaching methods used by the teachers as well as the frequency of use of the various methods. Twelve types of teaching methods were listed out. Some space was provided for the respondents to add on any other method they have been using but not found in the list. The teachers were asked to respond by ticking according to the frequency of use of various teaching methods they use in teaching at present. The frequency rating was on a four point scale namely: Frequently and Consistently (Daily), Fairly Often (Weekly), Once in a while (Monthly) and Seldom or Never.

Section Three of the questionnaire was structured to find out how often teachers promoted higher order thinking skills while teaching. This section was divided into two parts. The first part focused on the actions of the teacher that promotes higher order thinking while teaching. The second part focused on the student centered activities given by the teacher to promote higher order thinking skills. The teachers were requested to respond to the frequency of use for both parts and the whole section was rated on a four-point scale of Daily, Weekly, Monthly and Seldom or Never.

Section Four of the questionnaire listed eight forms of resources that are available from ICTs that teachers can use for teaching in the classroom. Teachers were requested to respond by ticking "yes" or "no" to their knowledge of these resources.

Section Five listed eight methods that teachers can use to promote higher order thinking skills using Information and Communications Technologies. The list of methods was structured from the descriptions given in the preceding chapters on how Information and Communications technologies can be used to promote higher order thinking skills. Teachers were requested to respond by ticking to whether they knew how to use and also whether they have experience in using these methods for teaching.

Section Six suggested 10 problems that may be obstacles to the use of Information and Communications Technologies in teaching higher order thinking skills in the classroom. Teachers were also requested to tick against a checklist. Space was also provided for them to add on other problems that may not have been mentioned.

3.5 Validation of Instrument (Pilot Study)

For the purpose of validation of the instruments, the questionnaire was administered

to ten teachers. While responding to the questionnaire they jotted down problems they had with some parts of the questionnaire. Subsequently, certain minor changes were made to make the instructions clearer and more specific.

In Section two, where for columns stating "frequently and consistently", was added "daily" in brackets in order to make it more specific. For "fairly often" was added "weekly" and for "once in a while" was added "monthly". The term "Information and Communications Technologies" was defined on the front page. There was a column in section six where the teachers were supposed to rank their problems. The teachers in the pilot study could not understand the instruction even after the researcher explained it. After analyzing the responses it was found that the information was not necessary so it was deleted. On the whole the teachers experienced very little difficulty in responding to the questionnaire.

3.6 Administration of Questionnaire

The questionnaire was administered personally by the researcher to the identified teachers while waiting for lectures to begin or after lectures as the respondents were all part time Masters in Education students. The researcher was at hand to explain any terms the respondents found were difficult. It took about 15 to 20 minutes to respond to each questionnaire. Overall it took three weeks to collect fifty seven questionnaires. Out of these only fifty were chosen for analysis. The seven that were discarded were incomplete questionnaires.

3.7 Methods of Analysis of Data

The data was collected, coded and processed using simple descriptive statistics according to the needs of the research questions as described below:

For research question 1: What teaching methods are teachers with computer literacy using to teach? How frequently are they using these methods?

From section two of the questionnaire the percentage of teachers who used every method was calculated and analyzed.

The frequency of use of the various methods was compared using their mean scores.

Since their responses were scored on a 4 -point scale, the mean nearest to 4 showed the highest frequency of use and the mean further from 4 showed less frequency of use. The middle score for the scale was 2.5.

The percentage of teachers who used the various methods on a daily, weekly and monthly basis was analyzed.

For research question 2: How often do they promote higher order thinking skills while teaching?

From the responses in section three of the questionnaire their scores were converted to a numeric value using a 4- point scale. The highest score according to the scale would be 45 and the lowest 0. The middle score would be 22.5. For those who scored more than 22.5 would be considered as frequently promoting higher order thinking skills and those who scored less than 22.5 would be considered as promoting it less frequently.

For those who scored above 22.5 further analysis was done by investigating the kind of activities they used to promote higher order thinking skills. The percentage of use of teacher centered activities and student centered activities for every respondent was

calculated. The number of teachers who used more teacher centered activities were compared to the number of teachers who used more student centered activities.

For research question 3: Are teachers aware of the resources available through the ICTs that can be used for teaching?

This question was answered by analyzing section four of the questionnaire. The percentage of teachers who responded for each resource listed was calculated and compared.

For research question 4: Do the teachers know how to use teaching methods that can use ICTs to promote higher order thinking skills?

The responses from section 5 of the questionnaire was used to calculate the percentage of teachers who knew how to use the various methods listed as well as the percentage of teachers who have used these methods. The scores for those who knew how to use and the scores for those who have used it in teaching were correlated using the Pearson's r.

For research question 5: What are the problems the teachers think limit their use of ICTs in promoting higher order thinking skills?

The responses from section five was analyzed using percentage scores for each problem in order to answer this question.

3.8 Summary

This project paper investigated the teaching methods used by fifty computer literate teachers and attempted to find out whether they frequently promoted higher order thinking skills while teaching. It also aimed to find out whether these teachers were aware of teaching resources available from the ICTs and also whether they knew how to use them for teaching. The problems they faced in using ICTs to promote higher order thinking

s was also investigated. The research questions were formulated to seek answers from teachers' perspective.

The next consideration was the selection of suitable research instrument to collect information that would help substantiate the research questions.

A questionnaire was administered to fifty seven teachers who were considered to be computer literate. Results obtained from fifty teachers were analyzed in sequence with the research questions using simple descriptive statistics and then reported accordingly in chapter 4.