

Chapter 3

METHODOLOGY

Introduction

This research paper attempts to determine SMK Dato' Sedia Raja's academic staff knowledge of issues related to Smart Schools and their readiness to teach in these schools. It will henceforth seek ways to expose more teachers to the smart school concept.

This study also aims to identify the types of technological knowledge and skills teachers already have and to suggest ways to equip teachers with more appropriate and relevant knowledge and skills required to use technology in their teaching. In addition teachers' opinions of integrating technology in the teaching and their readiness to use technology in the learning process will also be discussed.

This chapter is presented in five sub-sections namely ; subjects, instrumentation, procedure, pilot study, and statistical analysis of data.

Subjects

Subjects of this survey are teachers of SMK Dato' Sedia Raja, a rural school situated in Rembau. This particular school was selected due to its' technological status as one of the fourteen prototype schools selected for the Electronic Resource Center (ERC) Project and a future Smart School. Initiated in 1995, and launched in 1996 collaboratively by the Educational Technology Division (ETD) and Telekom Malaysia Berhad is was also known as "Rangkaian Munsyi". "Munsi" being an old Malay terminology for "tutor" or "learned guru".

The ERC project which is a form of distance learning is aimed at creating a thinking and knowledgeable Malaysian society that is information-rich. This objective is very much similar to that of Smart Schools. Among its' other objectives are, to ensure speedy retrieval of information, to achieve more effective and efficient space management, to provide unlimited resource sharing among other project schools via the Local Area Network, Wide Area Network and the Internet, to allow the sharing of bibliographic information among resource centers, and to act as a medium to improve the activity of users in schools.

A total of 63 teachers, 26 males and 37 females make up the whole academic staff of SMK Dato'Sedia Raja, situated in Rembau, Negeri Sembilan.

This specific study excludes the three heads of school, they are the principal and her two senior assistants, as their duties are more of administrative rather than

teaching. At the time of the survey one teacher was away on maternity leave. This leaves a total of 57 academic staff members for the actual study.

All the 58 questionnaires (100%) distributed to the teachers, were returned. As there was one incomplete questionnaire it was discarded, thus leaving an actual sample of 57 teachers representing 98.3% of the school's academic staff.

Instrumentation

This survey was carried out through a seven-page questionnaire adapted from analysis of scales developed by Delcourt and Lewis(1987),Murphy, Coover, and Owen (1988), and Loyd and Gressard (1984) (see Appendix I) .

The Questionnaire

A total of 11 main items constitute the entire questionnaire that can be completed in an estimated time of 15-20 minutes.

Three factors measuring respondents knowledge and skills of word processing (computer), electronic mail and CD ROM databases were selected from Delcourt's Analysis of Scales and revised. Another two factors, measuring knowledge and skills of internet and multimedia were designed and added to the questionnaire based on the researcher's personal experiences from taking courses in educational technology, internet and multimedia.

Other items in the questionnaire (Items 1-7, 8,11 and 12) were also designed and added to the questionnaire to answer the research questions.

Administration of the Questionnaire

Item 1-7 were designed by the researcher to obtain demographic information of the subjects to be used as background data of the study. These include, Item 1- age, Item 2-gender, Item 3-academic qualification, Item 4- professional qualification, Item 5-teaching experience, Item 6-location of school and Item 7- grade of school.

This information will describe and identify the characteristics of the respondents who were selected for this study. Respondents are required to tick the relevant boxes and give necessary information where necessary.

The subsequent survey items (Item 8-11) were designed to solicit information to answer the research questions in the following sequence :

Item 8, designed to answer Research Question 1 comprised of 20 statements measuring teachers knowledge on 7 selected aspects of Smart School. A-generic, B-philosophy, C-technology, D-curriculum, E-roles of teachers and students, F-assessment and G-types of school.

This item was designed to gain information of teachers knowledge related to Smart School using 12 correct statements and 8 incorrect statements about Smart

Schools. Respondents were required to tick to show their agreement or disagreement in the spaces provided.

The results from this test item were analyzed in two forms; using frequency counts and percentages and using analysis of mean and standard deviation.

i. *Using Frequency Counts and Percentages* : Data collected from teachers' responses were coded and analyzed according to teachers' score on each of the 7 aspects and tabulated to determine the level of their knowledge on each of the aspects. The scores were converted into percentages and scaled into 5 categories to determine the level of teachers' knowledge on each aspect. For instance, a score between 0-20 % falls into the very low category, 21-40 % as low, 41-60 % as average, 61-80 % as good, and 81-100 % as excellent.

ii. *Using analysis of Mean (M) and Standard Deviation (SD)* : Data collected from each of the 7 aspects were analyzed and processed to obtain the mean score and standard deviation of each of the 7 aspects. These values were analyzed to determine the level of teachers' knowledge on each aspect ,and also as compared to the other aspects. Teacher readiness to teach in Smart School as measured by their knowledge was analyzed and determined based on the overall results of both (a) and (b) above.

Item 9, designed to answer Research Question 2 comprised 5 main factors measuring respondents technological knowledge and skills of word processing (computer skills), electronic mail and CD ROM databases were selected from Delcourt's Analysis of Scales and revised. Another two factors, measuring knowledge and skills of internet and multimedia were designed and added to the questionnaire based on the researcher's personal experiences from taking courses in educational technology, internet and multimedia.

The 5 main factors in Item 9 were subdivided (unevenly among the factors according to their importance and scope) into 50 smaller parts each measuring a particular skill or knowledge and totaling 100%.

Respondents were required to tick the relevant boxes to indicate their technological competencies. A score of 2 points (or 2%) was allocated for every knowledge and skill the respondent possessed.

The results from this test item were coded , calculated and analyzed *using analysis of Mean (M) and Standard Deviation (SD)*. Data collected were coded and calculated to derive at the mean scores and standard deviation. For purpose of analysis, the 10 statements in Item 9 were divided into 2 parts. All positive statements were grouped into Part 1 to determine factors that may speed up teacher readiness and all negative statements were grouped into Part 2 to determine factors that may slow down teacher readiness to teach in Smart Schools.

Teacher readiness to teach in Smart School as measured by their technological knowledge and skills was analyzed and determined based on the overall scores of teachers in all the 5 factors.

Items 10,designed to answer Research Question 3 comprised 10 statements measuring teachers' opinions of why integration of Information Technology into Smart Schools is essential.

Respondents were required to tick the relevant boxes to indicate their agreement or disagreement with the listed opinions.

The results from this test item were summarized using keywords , calculated and tabulated *using frequency counts and percentages*. Data collected from teachers' responses were coded and analyzed according to total teachers' score on each of the opinions and tabulated to determine their positive opinions and negative opinions towards the integration of Information Technology. These scores were converted into percentages to determine the number of teachers who think that integration of Information Technology in Smart Schools is essential.

Item 11,designed to answer Research Question 4 consists of 10 technological statements , 6 positive and the remaining 4 negative measuring respondents opinions of their abilities and readiness to teach with technology in Smart Schools.

Respondents were required to tick the statements or opinions to show their technological abilities or disabilities.

The results from this test item were divided into two parts. Part 1 consisted of all positive opinions that may speed up readiness, and Part 2, all negative opinions that may slow down their readiness to teach in Smart Schools.

Using frequency counts and percentages data collected from teachers' responses were coded, analyzed and totaled to determine percentages of teachers who were ready, percentages who were uncertain and percentages who are not ready depending on their opinions of themselves.

Teacher readiness to teach in Smart School as measured by opinions of their abilities or disabilities was analyzed and determined based on the overall abilities of all the teachers in the survey.

Procedure

The questionnaire that was administered in this study was partly adapted from Delcourt's Analysis of Scales and partly designed to seek answers to the research questions. The researcher made a telephone call to SMK Dato' Sedia Raja , which was selected to carry out the survey. The purpose of the call was to request for approval to administer the questionnaire to the academic staff in the school.

With consent from the school's senior assistant, the researcher visited the school and presented a letter requesting formal approval from the principal, which stated the intention of the survey (See Appendix IV).

In an effort to minimize disruptions to the school's teaching and learning process, the researcher met the staff and distributed the questionnaires to them during recess. Completed questionnaires were collected on the same day, leaving the remaining ones to be collected within the week. As a form of appreciation for their support and cooperation, all respondents were given a small souvenir.

The following week, the researcher called and made an appointment to see the teacher-in-charge of the school's Electronic Resource Center (ERC). The purpose of the second visit was to collect the remaining questionnaires and to have an informal interview with the teacher-in-charge and also to collect data and background information on the ERC Project.

During the time of the survey which was between 6 to 17 March, 1998 the school had an enrollment of 63 teachers and 1,500 students which is the case of an average size Grade A secondary school. This particular Munsyi school is representative of secondary schools in Negeri Sembilan in size and its teachers : students ratio.

Pilot Study

Since the instrument designed for this study was a revised and a more extensive version of Delcourt's Analysis of Scales used to measure Self-Efficacy for Computer Technologies, a pilot study was conducted on five academic staff members of SMK Teknik Tuanku Jaafar, in Seremban. The purpose of the pilot study was to determine the clarity, reliability, and validity of the item pool.

Some alterations were made to the questionnaire due to some uncertainty and comments from the teachers pilot tested. Item 9, originally worded "I am capable" was reworded to "I can". Item 11 was added to the questionnaire after the researcher realized that the items in the survey questionnaire were insufficient to provide information on teacher readiness to teach in Smart Schools.

Statistical Analysis of Data

Data collected from the survey were coded, calculated and presented using simple tables of descriptive statistics and analysis of the findings. These results were analyzed to answer the research questions sequentially as discussed in Chapter 1, (See page 10).

This survey analysis was carried out in two statistical forms in relation to the research questions :

1. What do teachers know of Smart Schools?

The results and findings were analyzed using frequency counts, percentages, mean scores and standard deviation.

2. What are the characteristics of teachers who possess technological knowledge and skills?

The results and findings were also analyzed using frequency counts, percentages, mean scores and standard deviation.

3. Why do teachers think that the integration of Information Technology into Smart Schools is essential?

The results and findings were analyzed using frequency counts, and percentages.

4. What do teachers think they need to be ready to teach in Smart Schools?

The results and findings were also analyzed using frequency counts, and percentages.

Conclusion

The applications of simple descriptive statistical analysis of frequency counts, percentages, mean and standard deviations were able to derive at sufficient and satisfactorily accurate findings of the research topic.