CHAPTER 3

METHODOLOGY

3.1 Introduction

This study can be classified as an exploratory-descriptive study. It attempted to explore and investigate the use of information technology in meeting instructional needs for special education program activities in special schools in Malaysia. The main objectives for this research were to establish the main domains for special education teachers’ instructional materials (information, data and strategies) seeking practices. The study also focused on identifying and evaluating the current computer and IT knowledge levels, usage, barriers to the use of IT facilities and desired IT-related competencies. The nature of the study required a mixed-method approach including the use of systematic observation, questionnaires and interviews. This was for one basic reason that a combination of IT usage and special education instructional needs was a new area of research in Malaysia. As a result, there was not much local literature on this particular subject.

According to Blurtit (2007) and Sekaran (2000) an exploratory study is described as an approach undertaken when very little or nothing is known regarding the situation at hand. Alternatively, this kind of research is conducted when no information is currently available on how a similar problem or research issues have been handled and resolved in the past. This was the exact situation when the researcher embarked on this study. The researcher had little knowledge not only on special education program activities, but also how special education teachers employed IT-based resources to meet their instructional needs.
On the other hand, a descriptive study is the one which tries to define or measure a particular phenomenon, usually by estimating the strength or intensity of a behavior or the relationship between two behaviors (Dane, 1990).

Therefore, there was no better alternative other than carrying out an exploratory study for this particular research. The study was undertaken in order to understand the nature of the special education instructional needs that could be addressed through the use of IT-based resources. It also undertook to assess the level of IT knowledge and experience among the local special education teachers. Although there were many studies on the application of IT in special needs instruction especially in the United States and Europe, none of such studies had been conducted here in Malaysia. Therefore, a qualitative approach was employed to collect data through systematic observations and some extensive interviews. This was vital in establishing certain facts that were unknown and hence more needed crucial information was unearthed in order to develop a viable research design.

This chapter covers sections on; research design, population, questionnaire and questionnaire design, contents of the questionnaires, pre-test, interviews, validation, pilot study, empirical study, reliability test, data analysis and conclusion.

3.2 Research Design

A research design is a plan of action whose main purpose is to guide the researcher regarding the choice of methods and procedures for gathering, analyzing and interpreting data. In other words, it is a plan which helps the researcher to generate answers for the research questions (Burns, 2000a). Hence, it weaves through the
objectives, the research questions of the study, and the data gathered to the conclusions which are arrived at, and recommendations drawn at the final stage of the study.

In order to achieve the goals of this study, the researcher adopted a mixed-method approach. This method includes both qualitative and quantitative techniques of collecting data. In this particular study; questionnaires, interviews and observations were employed. Patton (1990) suggested that a combination of methodologies strengthened a research design. Both qualitative and quantitative researches provide complimentary types of information. As a result, the strengths and weaknesses of qualitative and quantitative approaches can compliment each other to achieve desired outcomes (Davies, 1997; Neuman, 2000).

As noted by Descombe (1998), the main differences between quantitative and qualitative research were related to the treatment of data and not the research methods per say. For instance, quantitative research tends to be associated with analysis and numbers as the unit of analysis, large-scale studies, a specific focus, researcher detachment, and predetermined research design. On the other hand, qualitative research tends to be associated with descriptions, words as the unit of analysis, small-scale studies, holistic perspective, researcher involvement and an emergent research design.

Davies (1997) stated that qualitative research provides an opportunity to “get close to the data”, to see and hear respondents express their thoughts in their own words. This provides an opportunity to draw insights and explanations from the respondents themselves. Hence the researcher does not have to pre-determine areas of response or study importance.
Patton (1990) commented that qualitative methodologies provide avenues that can lead to the discovery of deeper levels of meanings. Therefore, these methodologies were quite relevant for this study as there were a much smaller number of special education teachers in the Federal territory and Klang Valley areas.

According to Davies (1997) and Gorman and Clayton (1997) quantitative research focuses more on numerical or statistical data. As for Fitzpatrick Secrist, and Wright (1998), a quantitative technique was defined as counting, scaling and abstract reasoning. Furthermore, quantitative methods focus on the strict quantification of observations and quite often incorporate large-scale sampling procedures and the use of statistical tests to study group averages and variables (Kopala and Suzuki, eds 1999).

3.2.1 Importance of a Mixed - Method Approach for this Study

A mixed-method approach uses both qualitative and quantitative styles of research and data collection procedures (Neuman, 2000). This method is ideally used where both qualitative (through observations and interviews) and quantitative (through numerical and statistical methods) are adopted. According to Gorman and Clayton (1997) and Fitzpatrick, Secrist, and Wright (1998), the main argument for the use of this method is that, when two or more methods are employed, the researcher is able to adopt a multidimensional approach. This approach enables the researcher to address different aspects of the same research questions thus broadening the dimension of the study. This tends to improve the quality of the research and conclusions arrived at are more likely to be comprehensive, logically correct and generally acceptable.

The mixed-method approach in a research study usually includes preceding or following up a quantitative study with some interviews or field observations to support,
disapprove or come out with statistical findings or both. The philosophy behind this approach is that the systematic synthesis of different methods will compensate for some of the inherent weaknesses of the individual methods when applied alone (Kopala and Suzuki, eds., 1999; Punch, 1998).

When the multi-method approach is applied, the credibility of the findings is enhanced by comparing data obtained from different sources or from different investigations or from different methods of collecting data. In such a situation where comparisons show what the findings hold, then one can have more confidence in their interpretations and final conclusions from the study (Wilson and Hammond, 2000).

The mixed-method approach is more of a direct check on the validity of the study findings by cross checking them with other sources of data. If a researcher’s conclusion is supported by data from multiple sources, then one can be more confident of its validity. Alternatively, this approach can involve comparing data produced by different methods, for example, observational data can be compared with interview data, or it can involve comparing data from different times, sub-settings or subjects (Sapsford and Jupp, 1996).

An ethnographic study was conducted both before and after designing the objectives and research questions for this study, with the researcher as a participant observer. This study was important as it was used to clarify certain unclear concepts, and to view the real practical information needs as encountered by special education personnel. This was followed by the survey methods to collect data through questionnaires and group interview sessions.
3.2.2 Morgan’s (1998) Priority-Sequence Model Framework

In order to clarify how this research was conceptualized, Morgan’s (1998) priority-sequence model as adapted from Morse (1991) was employed. The model supports a mixed-method approach. The researcher was guided by the framework in the process of determining priority. The researcher was able to choose the quantitative approach as the principal data collection method as it was believed to have the strength that was required to achieve the research goals. On the other hand, the contrasting complementary method (qualitative method) was chosen as it offered the strengths that were needed in the research design’s overall ability to meet the research goals.

The main goal of the research study was to maximize the value of the collected data; hence the complementary method was made to follow the main data collection process. Therefore, the QUANT-qual-sequence framework guided the researcher in the data collection procedures, data analysis and discussion of findings.

3.3 Population

The population for this study comprised of 120 special education professionals. They included; teachers, assistant teachers, program coordinators, speech therapists, psychologists and other related staff like physiotherapists. These teachers or professionals were drawn from a total of 15 special education schools or centers from the Federal Territory and the Klang Valley areas. They assumed more or less the same responsibilities. Most important of all, they were all involved in implementing a special education curriculum. They were directly or indirectly in charge of all day today curricular and extra-curricular activities in their respective schools. The student body composition of most of the special schools was more or less the same, although in some cases, there were slight differences in terms of population size.
Generally, there were six types of special schools or education centers in and round the Federal territory and the Klang Valley area, Selangor, Malaysia. They include; mixed races Malay medium schools, Chinese medium schools, Tamil medium schools, Malay medium schools (for Malays only) and mixed races English-Malay media schools, and others based on International schools’ standards and followed for example, a British curriculum. (Vias, 2005)

Among the six categories, mixed races Malay medium schools and English-Malay media schools for mixed races were regarded as the most representative of the special needs schools because various ethnic groups were best represented among them. A total of fifteen (15) special schools or education centers were randomly selected from a total of 30 Malay and English-Malay media special schools.

In order to select the special schools for the study, a list of all Malay and English-Malay media special schools in and around the Federal Territory and the Klang Valley areas were obtained from Selangor State council of Social Welfare Office. In an effort to verify the authenticity of the above list, it was compared with another list from the special education unit, Ministry of education, Malaysia.

Some background information on the establishment of these schools indicated that three broad categories existed. First, there were schools that catered for the general public and were established through government legislation. On the other hand, some individual parents who felt the need to provide suitable education for their special needs children after being dissatisfied with the mainstream systems had decided to set up some private education centers. There were also schools or centers which were set up and followed International School standards However, regardless of their backgrounds, all these
schools or education centers emphasized a specially designed curriculum to cater for the needs of special children (Sebastian, 2004).

These schools offered educational opportunities to children with various types of disabilities. The children’s unique features and special characteristics included; down syndrome, autism, mental retardation, attention deficiency hyperactivity disorder (ADHD), emotional instability and behavior problems. Most of the children in these schools had their ages ranging from 2 years (early intervention) up to 20 years (simple and advanced vocational classes). The total enrolment differed from school to school. Generally, the number of students was between 20 and 70 children depending on the availability of facilities to support the educational programs. Most of the schools were generally divided into junior or early intervention classes, intermediate or lower middle academic (integration), behavior problem classes, and upper level (senior or vocational classes).

However, not all schools had all the above-mentioned student levels due to differences in chronological and mental age, academic levels and program structure. The special schools selected for the study were among those based on a curriculum which emphasized a cognitive program, language and communication skills, gross and fine motor development, social (interpersonal) skills, self-help (and house craft) skills, sex education and personality development, as well as nature and simple science education. On the other hand, the schools supplemented their curricula programs with one or more of such extra-curricula activities as art and craft, drama, horse riding, yoga, sports, music and movement etc...However, this particular research was conducted based on the six main curricular domains as emphasized by all the special schools.
3.3.1 Selection of Sample

A sample of English and Malay media special education teachers, educators, program coordinators and other related staff employed in and around the Federal territory and the Klang Valley, State of Selangor, Malaysia were selected for this study. The selected areas for the study were located around or near the Multimedia Super Corridor (MSC), Malaysia’s premier hub of information and communications technology (ICT). Selangor was the most ideal populous state with a good cross-section of the various ethnic groups as well as urban and rural dwellers. There was a good IT infrastructure in the selected geographical location of the study. It was therefore assumed that, special education professionals and related personnel in this part of Malaysia were relatively well exposed to IT facilities in general and had good access to the use of computers in particular as well as other IT facilities, resources and services.

The survey sample was made up of a total of 120 respondents. They included special education teachers, assistant teachers, program coordinators, therapists and other related personnel / staff. At least 40 subjects of the sample population were actively involved as classroom teachers. Another 40 subjects were also actively involved as they performed assistantship responsibilities in either daily teaching or helping to organize or manage curricula and extra-curricula activities.

Another 20 participants were actively involved either as principals, assistant principals or program coordinators. The rest for example, speech therapists, consultants, and psychologists performed tasks that helped in planning IEP objectives or other supportive roles for special needs programs. Hence the last 20 respondents included speech therapists, psychologists, special education consultants or other professionals identified to be dedicated to IT developments for special needs education.
Each of the selected special schools had at least 6-7 personnel involved in planning, implementing a curriculum, or executing and supervising learning activities. The head teachers, program coordinators and classroom teachers were chosen because they played a pivotal role in planning and executing special education programs and activities.

A hundred out of 120 respondents were professionals including head teachers, teachers, assistant teachers, program coordinators, speech therapists and physiotherapists. Most of them were part of, and followed the Federal and Selangor State education systems. Almost all their schools held memberships in the Selangor State Council of Social Welfare, National Council of Social Welfare and were legally registered under the Ministry of Education, Malaysia.

3.4 Data Collection Instruments

For the purpose of this study, data was primarily collected through a combination of a questionnaires and group interview discussions. In addition to the above, the researcher also carried out some initial ethnographic studies in a few special schools. This helped the researcher to experience real life situations with regard to the demand for and use of information in the day to day curricula activities in a special school environment.

3.4.1 Ethnographic studies

Some ethnographic studies were carried out in a few special schools right at the beginning of this study. Ethnography is a method of observing human interactions in social or work settings. It can also be described as the observation of people and their natural behaviors in their cultural contexts. Here, culture is defined by Massey (1998) as being “…made of certain values, practices, relationships and identifications.” Thus, one
can describe a work place for example a school, as a culture filled with work standards, business practices (both formal and informal), and relationships between workers, coworkers and managers. The main objective of this approach was to have a thorough understanding of situations regarding the use of IT in generating information for special education programs. Thus, all three activities including contextual inquiry, observational study and participant observation were used together as basis of a thorough ethnographic study.

Although computers were being used in schools, a study in the use of IT resources to generate information for special education programs was quite new. Therefore, an ethnographic approach was important in this study. It enriched the research process by providing first hand information and experiences on the role of IT based resources as a source of information for special education teachers. The importance of this approach was also summarized in its goal as McCleverty (1997) observed that “The goal of an ethnographic study is to identify routine practices, problems and possibilities for development within a given activity or setting.”

Having observed special teachers in their real natural environments, and having joined them in their tasks, this experience in itself provided a first hand sense of their information needs, concerns and unspoken frustrations. This approach provided the opportunity to observe exactly how things were done in real special school settings. Also some useful data was gathered and incorporated into preliminary research designs. In addition, some of the collected research data from the studies was used to enhance research precision in the early stages, and was essential in supplementing and commenting on statistical findings during the data analysis stage.
Some ethnographic works and other studies have been conducted in education. However, among those related to technology and education were.... Investigation of social context of school computer use (Friedman, 1991) and....technology based materials in the elementary classroom (Russek, 1991).

In a nutshell, an ethnographic method was important as an eye opener. It enabled the researcher to accumulate a good amount of knowledge about special education program activities. It also helped the researcher to delve into details of IT- resource ventures versus instructional and curricular information needs. This method helped to shape and nurture the researcher’s intellectual character and mental frame in order to be able to make measured, rational and wise judgments of the research findings at the end of the study.

3.4.2 Questionnaire Design and Delivery

In order to compile, design and develop data collection instruments (i.e. study questionnaires and focus group interview questions), a careful process of collecting and gathering the required information was carried out in many ways. In the first place, an extensive literature review, preliminary interviews with experienced special education professionals, and potential respondents provided a multitude of possible questionnaire items. On the other hand, the researcher conducted a thorough literature review in order to familiarize himself with the conceptual foundations as well as major issues in special education program activities, special teachers’ instructional needs and their use of information technology.

A Structured Questionnaire was developed covering such topics as special education program domains, computers and IT-based resource use for instructional purposes,
barriers to the use of IT and desired IT-related competencies among special education professionals.

Initially, the researcher informed the school principals about the upcoming study. This was done using a written letter, telephone call, e-mail message or personal visits. The researcher also used the same opportunity to explain the purpose of the study to the school principals. At the same time, the school principals or head teachers were requested to explain the aims of the study to their staff members especially those who were enlisted to participate in the study based on the guidelines provided by the researcher.

When they agreed to participate in the study, the researcher requested the school principals to provide names of at least 7-10 staff members who would participate in the study. Then the researcher informed the principals of the dates when the questionnaires would be delivered to their schools. They were also notified of the dates when the questionnaires would be collected by the researcher, or were to be posted to the researcher, using the self-addressed and stamped envelopes sent together with the questionnaires.

3.4.2.1 Contents of the Questionnaire

The final Instrument (included in the Appendix A) was made up of six main parts:

1. A questionnaire concerning the respondents’ information on gender, age, education qualifications, work experience, staff category and school category. Generally this part contained at least 6 items.

2. The second part was one of the Information Technology and computer use section. It analyzed various views and opinions of special education teachers regarding their
knowledge of IT and computer use in meeting instructional needs for special education program activities. This part contained 7 items of structured questionnaires with responses provided on a 5-likert scale.

3. The third part of the research instrument was composed of at least 6 items on IT and special education resources questionnaire. It was aimed at finding out how special education teachers used computers and IT-based resources to access information for planning instruction and meeting program objectives.

4. The fourth part of the research instrument was about special education curriculum domains. It contained 6 items which were normally part of a special education curriculum. It was aimed at determining the amount of information required by special education teachers on each curricular domain.

5. The fifth part of the research instrument was about factors affecting use of information technology in special schools. This part contained 2 items aimed at examining factors which facilitated or hindered the use of computers and IT-based facilities among special education professionals.

6. The sixth part contained an IT-related competencies questionnaire (10 items) and an open ended opinion / suggestions questionnaire (1 item).

The following is a summary of the research questions as reflected in the questionnaire and the expected source of information for each question from the various parts of the research instrument.
Table 3.1

Summary of Source of Information for the Research Questions

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Source of Information</th>
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<tbody>
<tr>
<td>1. What are the main curricular domains for special education teachers’ instructional or information seeking practices?</td>
<td>Questionnaire Part IV: Questions 20 – 25; Interview Question 1</td>
</tr>
<tr>
<td>2. What is the current level of computer and IT Knowledge among special education teachers?</td>
<td>Questionnaire Part III: Questions 14 – 19; Interview Question 2</td>
</tr>
<tr>
<td>3. How do special education teachers use their current level of computer and IT knowledge to meet their instructional needs?</td>
<td>Questionnaire Part II: Questions 7 -13 Questionnaire Part III: Questions 15 – 18 Interview Question 3</td>
</tr>
<tr>
<td>4. Are there any statistically significant factors that special education teachers consider to be facilitators or barriers in using IT-based resources to access information for program activities?</td>
<td>Questionnaire Part V: Questions 26 (a) – (f) 27 (a) – (f) Part VI: Question 38; Interview Question 4</td>
</tr>
<tr>
<td>5. To what extent are some IT related competencies considered essential for special education professionals?</td>
<td>Questionnaire Part VI: Questions 28 – 37 Part VI: Question 38 ; Interview Question 5</td>
</tr>
</tbody>
</table>

During the survey each respondent was requested to tick (✓) the appropriate choices that best described his / her personal data. Furthermore the questionnaire sought the respondents’ knowledge on information technology and computer use. In this case, each respondent was to decide among the options that were provided and ticked (✓) whatever was appropriate or best fitted his or her opinion based on personal experiences.

As for research instruments number 15 and 17 of the third part of the questionnaire, respondents were requested to list some of the World Wide Web pages, e-journals, newsgroups, listservs etc. that they had recently accessed for the purpose of finding information for their daily classroom activities. In the same section of this part of the questionnaire, respondents were asked to rate their opinion on the importance of the IT-based resources usage (on a scale of 1- not important to 7- most important), and current level of knowledge and experience regarding their use of the different IT-based resources to access information for planning instruction and curriculum implementation (on a scale of 1- for not able to 7- for excellent).
In the fourth part of the questionnaire, respondents were given a list of domains that were normally part of a special education curriculum. They were then requested to circle the number that best described the amount of information that they wanted to have on each domain ranging from 1 (not at all) to 7 (all available information).

In the fifth part of this questionnaire, respondents were asked to indicate some factors that had encouraged or discouraged them in their efforts to use computers and IT-based resources to access information for planning instruction and curriculum activities. Respondents were requested to indicate their opinion on the importance of the factors ranging from 1 (not important) to 7 (most important).

In the last part of the questionnaire on IT-related competencies, respondents were given a list of items which were used to express IT-related competencies for special education professionals. Based on a scale of 1 (not important) to 7 (most important), respondents were requested to circle the number that best indicated their opinion on the importance of each item for their IT competency.

Finally, respondents were asked to express their ideas, opinions and suggestions as to how the usage of computers and IT resources could be enhanced among special education professionals.

The main advantages of the questionnaire research instrument as agreed upon by Fife-Schaw (2000b) and Neuman (2000) were that, relatively low costs were involved in the development, design and use of instrument in the data collection process. Secondly, the instrument was used with minimal assistance and facilities and hence was quicker for respondents to answer. Also, the use of the survey instrument provided access to widely dispersed samples that for some reasons were otherwise difficult to reach by telephone.
or in person. Finally, the use of the survey instrument was convenient. Respondents had sufficient time to give thoughtful answers, and to look up records or to consult with others.

3.4.2.2 Pre-test

Pre-testing is an essential exercise and an important phase of survey research. A survey can only be trusted if the researcher endeavors to make sure that the respondents understood the instrument and provided appropriate responses. According to Hult (1996) research questions must be pre-tested such that the initial responses collected can be reviewed and the questions revised to clear any ambiguity before they are employed in the real research study. The pre-test exercise is usually carried out before an actual study by giving out a draft of the instrument to a relatively small group of people with similar characteristics as those to be finally used in the real study. Dane (1990) noted that a pre-test allows the researcher to fine-tune the instrument after trying out the measures to be used in the empirical study.

Hence the main purpose and goal of a pre-test was to find out how the data collection protocols and the survey instrument would work under realistic conditions (Fowler, 2002).

A pre-test was an essential part of the survey instrument development and design process. This procedure helped to test the usability of the instrument in terms of question sequencing and lay out from the respondents’ perspective. This exercise was also useful as it helped to evaluate the clarity of instructions for each section or question in the instrument with regard to wording or use of terminology. Hence the main
objective was to ensure that all questions were consistently understood and answered correctly.

In order to enhance the soundness and clarity of the research instrument, the researcher discussed the questionnaire with some selected experienced professionals in the field of study. Then, the proposed survey instrument was first pre-tested with ten selected individuals; four from the faculty of Information and Communications Technology at the International Islamic University, Malaysia (IIUM), two from the faculty of Education, University of Malaya and four senior teachers from The Malaysian Association of Guardians for the Intellectually Challenged (MAGIC), a special education Center. After receiving feedback from the pre-test participants, the instrument was revised based on their input in terms of comments and suggestions. Then, a second pre-test of the research instrument was conducted with 15 respondents from special education centers where actual participants in the study were identified. The participants in both pre-tests were encouraged to offer comments and criticisms regarding the questionnaires’ clarity, length, variables offered and the wordings or terminology used. Prior to the final version of the research instrument, all necessary modifications were done based on input from various quarters. For example, it was recommended that (PART II) of the research questionnaire needed to enlist responses based on a 5-likert scale with an option for neutrality for respondents who were not comfortable with any of the responses that were provided.

The final version of the research instrument was not translated into the Malay language as planned before, since it was clear that all participants in the study were conversant with the English language.
3.4.3 Group Interview Discussions

In addition to administering questionnaires, the researcher investigated the research topic in a much more detailed manner by conducting some focus group interview sessions. Discussion groups were thought to be appropriate for this study. This was so since ideas, opinions, and views of participants needed to be generated in candid, normal conversations, that addressed the selected goals of the study in an in-depth manner.

Focus groups were found to be reliable in this exploratory-descriptive research. This was due to the fact that, group discussions helped to generate information in a permissive atmosphere. Also, a more complete and revealing understanding of issues was reached at by all participants in each focus group discussion.

Thus a five – question interview guide covering all the main objectives of the study was developed for this purpose. (See Appendix D)

3.4.3.1 Purposive Sampling

Purposive sampling is popular in qualitative research. Subjects are selected based on some characteristic patterns, for instance - homogeneity allows focusing on the right participants, reduces unnecessary variation of opinions, simplifies analysis and facilitates group interviewing (Patton, 1990). In order to achieve the objectives of the research through group interview sessions, a purposive sampling plan was developed. Participants were selected based on pre-determined characteristics or criteria. The subjects were identified and selected based on the extent to which they were homogeneous and likely to contribute relevant and constructive ideas to a successful group discussion.
The subjects for the focus group discussions were identified and selected based on the following criteria:

a) Whether the special education teacher or other professional was currently using IT facilities to access information / data for special education program instructional needs

b) The length of time the teacher or professional had been using IT facilities for special needs instructional purposes (at least six months and above).

c) The grade level of students (early intervention, intermediate level / academic or senior / vocational level) for which IT facilities were being used in the instructional process.

d) Descriptive criteria of the students handled by the special teacher for example, autistic, downs syndrome, developmental delay, attention deficit disorder……etc

e) Personal data criteria of the special teacher or professional (for example, number of years of experience, educational level… (at least a diploma in education and two years of teaching experience).

3.4.3.2 Selection of Group Interview Participants

Subjects for the group discussions were identified through various ways. Some participants were identified by the researcher while carrying out some ethnographic studies in some special schools. Others were identified through communication with some special school principles and other administrative staffs. On some occasions, certain participants were identified by the researcher while attending special education professionals’ training workshops and seminars, in order to have a proper and detailed understanding of some special education issues. Also some special education
professionals helped to identify their fellow colleagues whom they knew, fulfilled the required criteria, and were willing to participate in group discussions.

Subjects for the group discussions were contacted by the researcher through personal visits to some schools, telephone calls, and e-mail messages. However, the telephone and short messaging system was the most effective tool for this purpose. It was the most convenient and effective way of contacting and sending reminders to prospective subjects regarding the scheduled group interview discussions.

Twenty six subjects were initially contacted and requested to participate in the focus group discussions. However, only twenty (77%) agreed to participate in group interviews. Finally, thirty subjects (115%) actually participated in group discussions. Thus an extra four subjects to the number initially contacted (twenty six) or fifteen percent (15%) more took part in the discussions.

Group discussions were used to generate alternative responses to research questions. This helped to bring an improved in-depth of understanding to research issues on the topic of study. Group participants were able to express their perceptions, ideas, views, opinions and reactions to various issues related to the use of IT and meeting information needs for special education programs.

On the whole, there were four focus group discussions. Two were held at Section 16, Petaling Jaya; one at Titiwangsa; and another one at the International Islamic University Malaysia (IIUM) Sports Complex Gombak respectively. Each discussion group was held for an average time of two hours.
Group interview sessions were used to gain insight into the inner workings, and details of use of information technology in meeting information needs for special education programs as experienced by special education teachers or other personnel. Group interviews were conducted after the research questionnaires had been collected and analyzed. The interview sessions were utilized to clear doubts and amend or correct any inconsistencies that had been noticed from the subjects’ responses to the questionnaires.

Statements from group sessions were used to identify and build individual or group opinions, ideas and themes. Some of the main opinions were on the other hand used to comment and supplement data when writing the final reports. Also, some of the main views played an important role in giving a more detailed understanding of the application of IT in meeting information needs for special education programs.

Generally, prior to the commencement of group interview sessions, participants were informed of the general topics as well as the purpose of the discussion. However, they were not told what the research questions were, nor were they given a very clear idea of the topic. But specific examples of the kinds of questions that would be asked were provided. This was done such that participants did not become too sensitized to the issue before the focus group interview itself.

On the other hand, all possible efforts were made to allay participant concerns and to help them feel comfortable about the focus group experience. It was stressed that the participants’ responses would be kept confidential.
3.5 Validity of Instruments

In order to ensure that the items developed in both the research instruments (Questionnaire and Interview guide) were reasonably appropriate, the instruments were tested for validity and reliability. In this regard therefore, validity addresses the issue of whether what we tried to measure was actually measured. One type of validity is face validity. It is regarded as the weakest form of validity. It is concerned with the degree to which a measurement “looks like” it has measured what it is supposed to measure (McDaniel and Gates, 1996). Validity assesses whether the test measures what it claims to measure (Burns, 2000b; Sapsford and Jupp, 1996). Hence validity is concerned with the extent to which an indicator accurately measures the concept (Fielding and Gilbert, 2000). According to Bernard (2000), validity is an important element in research. It addresses the accuracy and trustworthiness of instruments, data and the findings in research.

On the other hand, content validity is achieved when an instrument has appropriate content for measuring a complex concept or construct (Bernard, 2000). As part of the research instrument development process, it was logical to gather ideas, opinions, and views from special education teachers and educators who worked in special schools, dealt with special needs children and interacted with a special education curriculum on a daily basis.

Furthermore, a thorough study and review of existing literature during the development of the questionnaire helped to ensure adequate content validity. After the pre-test, the questionnaire was revised and sent to selected professionals in the area of study to check on the validity of the instrument. The professionals were able to validate the instrument
for face validity before conducting the pilot study. They were also instrumental and quite helpful as they also evaluated the appropriateness of the questionnaire content.

The professionals selected for this purpose were head teachers, program coordinators and special education teachers with considerable years of experience in special needs education. Also, a lecturer from the faculty of education, University of Malaya and two lecturers from the Institute of education, International Islamic University Malaysia were also included in the process. They were chosen based on their sound knowledge in this field and hence considered to have the insight to judge the relevance of this study.

The above professionals were encouraged and requested to provide their inputs and suggestions wherever they felt necessary. The researcher felt that the input of ideas from these professionals was very important and played an important role in contributing to the success of the design of the instrument.

3.5.1 Pilot Study

It is essential to conduct a pilot study as a preceding step to the actual empirical study. This is an important procedure that helps to try out the techniques and instrument in advance before a real full-scale study is carried out. Barrett (2000) noted that a pilot study should be carried out using a smaller group of subjects who have similar characteristics to those of the subjects who will be used in the real or actual study.

In order to test the practicability of obtaining data under real situations, a pilot study was undertaken. This was done by distributing the questionnaire to 30 out of the 120 selected special education professionals. They represented different categories of
participation in this study for instance, head teachers, program coordinators, teachers, therapists, etc.

The researcher made personal follow ups and made sure that all thirty (30) completed questionnaires were returned. The main aim of this pilot study was to ensure that respondents understood the instructions, the questions asked and that the instrument used was reliable and suitable for the area being researched. The researcher went through all the returned questionnaires and noted down all their input in terms of comments, observations, views and ideas. All these were used to improve the level of reliability of the instrument. The instrument was further revised and improved. This was in line with De Vaus (1991) who noted that, “good questionnaires do not just happen, they involve careful thinking, numerous drafts, thorough evaluation and extensive testing.” Also McDaniel and Gates (1996) pointed out that, creating the right questionnaire required both hard work and some level of creativity.

3.6 Empirical Survey

The exploratory-descriptive study was initially planned to cover a four months span divided into two two-month phases. During the first week of July 2004, the researcher distributed the research instruments to the subjects. They were sent both by mail and personal delivery, school by school. In order to ensure a high response rate from the respondents, the follow up exercise was done on a weekly basis either by telephone or personal visits. For the first two weeks of July, 2004 the researcher did the follow up exercise by telephone. However, during the last two weeks of the same month, the follow up was done by the researcher paying personal visits to the schools. In such cases
where the research instruments had been completed, they were collected by the researcher and taken for data entry into the SPSS data structure.

On the other hand, in such situations as to where respondents had misplaced their questionnaires, replacements were given to them. At the same time it also happened that, some respondents identified colleagues who were interested in participating in the study. In addition to 120 questionnaires which had been initially distributed, another thirty (30) instruments were given out during the follow up exercise to make up for those respondents who had either misplaced or lost their completed / uncompleted questionnaires.

The beginning of the second week of September 2004 highlighted phase two in the data collection process. During this time, the researcher contacted prospective subjects for the group interview sessions. Twenty six (26) subjects were initially contacted and a tentative interview schedule was delivered to them. The schedule included the suggested dates, place and time for the interviews. It also provided an advance period of adjustment and preparation on the part of the participants for at least three weeks. Each subject was asked to provide the researcher with five (5) days and blocks of times on those days when it would be possible to attend the focus group discussions.

As a result, three venues and three different dates were suggested. Each participant chose a date, venue and time which was most convenient based on personal commitments and circumstances. When all subjects had indicated their venues, dates… and confirmed their attendance, a final interview schedule was drafted. The draft indicated that, four group sessions were planned on three different venues on separate dates.
The interview sessions were expected to take place and actually did begin from the third week of October 2004. Each group discussion was held for an average time of two hours.

It was initially expected that all interview sessions would be completed by the end of the first week of November 2004. However, due to unavoidable circumstances, group discussions were not completed until the beginning of the fourth week of January – 2005. Therefore, the collection of all the research data was not completed in four months from the beginning of the exploratory-descriptive study as was originally planned. The data collection exercise continued until the fourth week of January – 2005 when all data gathering was finally accomplished.

3.7 Coding Process

Data coding was done in terms of both scale and non-scale data measurements. Some variables, for example, gender and professional categories were simply labeled using number codes as a classification into different categories. The numbers were used in an arbitrary sense such that there was no inherent quantitative implication to that effect.

On the other hand, ordinal measurement was applied to some variables for example, qualification of respondents. This was done as there was a clear implication of ordering of categories. Hence the researcher intended to classify subjects and indicate their relative standing on some dimension of interest.

Furthermore, all variables that exhibited some equal distance between amounts of their attributes were coded for interval measurement. However, those variables that combined some interval features as well as the presence of a meaningful zero point in their categories were coded for ratio measurements.
All data which was collected during the group interview discussions was initially recorded as transcripts. The researcher employed manifest and latent procedures for the data coding process. In the first place, the researcher mainly identified the presence and frequency of visible, surface text elements such as words, terminologies and sentences. Then these words or terminologies were assigned to parts of the transcripts which expressed a relationship to the goals as earlier defined in the study. Such words were; for example, web resources, IT competencies, barriers, cognitive domain.

Furthermore, latent coding was also applied on the transcript data. In this case, the researcher noted all the words and sentences which were manifestations of implied semantic messages, meanings and themes. Hence, they were used as indicators of the presence and frequency of occurrence of meanings as defined in the objectives of study. The researcher read text from the document and assigned to it a label indicating the criteria considered in the study, hence preparing it for further study, analysis and reporting.

3.8 Reliability Test

In order for the measures developed in the research instrument to be consistent and dependable, the instrument was tested for its reliability. The reliability test was carried out earlier based on the data of the pilot study and was later done on the data of the actual study. Burns (2000b) described reliability with the terms such as dependability, stability, consistency, predictability and accuracy. Reliability is the stability of the measures that generate and produce constant results by ensuring that there is homogeneity between the items in the questionnaire (Sapsford, 1999). Other scholars such as Fielding and Gilbert (2000), Rudestam and Newton (2001) discussed reliability concerns with regard to the consistency of measurements. Whenever there are few
errors, then the observations made become more reliable and hence a measurement that is free from errors is the correct tool for the study (McDaniel and Gates, 1996).

The internal consistency method was used in measuring reliability in this study. By using Cronbach’s alpha technique, a widely used test of reliability, the internal reliability of each item in the questionnaire was tested statistically. Black (1999) pointed out that Cronbach’s alpha is used to generate a reliability coefficient to indicate the level of internal consistency of the instrument or of a homogeneous section of an instrument. The explanations of Cronbach’s alpha for the items in the questionnaire are provided in the analysis of questionnaire data in Chapter 4.

3.9 Method of Analysis

Almost all data which was collected through the use of questionnaires consisted of information which was dominantly expressible in numerical form.

Therefore, quantitative – categorical analysis was applied to the data. Here, the method of analysis involved a study of questionnaires and their sets of categories, producing nominal, ordinal as well as interval and ratio-based analytical results. Hence the method of analysis produced statistical information on the whole. The information was in the form of frequency counts, and summary statistics, that is, minimum, maximum, mean, median and standard deviation. Where it was necessary to determine significant differences between variables, both an independent samples $t$ test and ANOVA were applied in the data analysis process.

When data generated and gathered through focus group interview discussions was being analyzed, a combination of various approaches was applied. This was due to the fact
that, all the approaches seemed to compliment each other in one way or another. They included; suggested approaches by Krueger (1988) of finding the big ideas, considering the choice and meaning of words, analyzing the context as well as the consistency of responses. Some other procedures used were an adaptation of the Constant Comparative Method (Glaser and Strauss, 1967) with some additional suggestions by Wells (1995) and Schatzman (1991). This method partly included the categorization of data and the selection of the core ideas which best explained the phenomena under investigation. Such core ideas were also subjected to the processes of theory delimitation and definition (Wells, 1995).

On the other hand, some elements of naturalistic inquiry (Lincoln and Guba, 1985) were also applied in the process. For instance, the researcher adhered to the standard of credibility. Hence such techniques as prolonged engagement, persistent observation, triangulation, and member checks were used to enhance the credibility of the study. However, as one of the methods of content analysis, qualitative analysis seemed to be an embodiment of all the above mentioned approaches.

Among other suggestions applied during data analysis were data summary, integration, generalization and classification of the data categories. Also, explication (explaining the text or parts of it by narrow context approach or wide context approach as well as objective hermeneutics were among the added options (Sarantakos, 1998).

The summary of the research design as undertaken during the study is presented in Figure 3.1 below.
Figure 3.1 Summary of the Research Design

- **Determination of Methodology**
- **Identification of Population**
- **Sample Selection:**
  - Selection of Population Sample for: a) questionnaire respondents, b) Interviews participants

- **Data Collection:**
  - Empirical Survey and Interview discussion sessions conducted

- **Design:**
  - Questionnaire and Interview guide

- **Pre-test:**
  - Questionnaire and Interview guide Pre-test

- **Instruments Design Stage**

- **Data Coding:**
  - Questionnaire data collected and coded using an SPSS 13.0 program
  - Data from interview sessions collected with an audio recorder, transcripted and coded using latent and manifest procedures

- **Analysis:**
  - Questionnaire data was analyzed to produce statistical information for instance, using t-test and ANOVA test – for significant differences

- **Analysis:**
  - Group interview data was analyzed based on: big / prominent ideas, a selection of core ideas and choice or meaning of words

- **Data Integration:**
  - Both Quantitative and qualitative data were integrated to compliment each other during the presentation and discussion of research findings from the exploratory study.
3.10 Summary of Chapter

The design of methodology in this study was based on an exploratory-descriptive nature. The independent variables in the research study were gender, age, level of education, years of experience, school category and staff categories.

In order to carry out the exploratory-descriptive study, some ethnographic studies were carried out and a six-part questionnaire comprising of 38 items was distributed to 120 special education professionals in the Federal territory and the Klang Valley areas.

In addition to research questionnaires, group interview discussions were conducted with a selected group of special education professionals from some special schools. The reasons for using the above mentioned instruments were outlined as well as their reliability and validity explained. Also highlighted in this chapter were; the empirical survey, an insight into the data coding process as well as overviews on quantitative and qualitative methods of data analysis as employed in this study.

The next chapter addresses the findings from the empirical survey.