CHAPTER 1

INTRODUCTION

1.1 Background to the Study

The 21st century has been dubbed the age of information technology (IT). It is however contended that this age was a result of the development and materialization of the personal computer in the late 1970s (Smith and Meyen, 2003). The new scenario created a lot of excitement, enthusiasm as well as expectations among educators. This was especially important for special education professionals. So what is special education?

Special Education is a term applied to the individually planned and systematically monitored arrangement of physical settings, special equipment and materials, teaching procedures and other interventions designed to help learners with special needs achieve the greatest possible personal potential of leading an independent life as far as possible.

In this case, specialized instruction is required for learning deficiencies determined by a team of experts. Hence the program recommended must be precisely matched to fit individual educational needs, as well as adapted to the child's learning style. Hence special needs students are unable to learn in a regular or standard classroom. Scientific attempts to educate children with learning disabilities originated in the efforts of Jean-Marc-Gaspard Itard, a French physician and otologist. In his classic work *The Wild Boy of Aveyron* (1807), he narrated his five-year effort to train, mould and educate a boy who had been found living in the wild in the woods of Aveyron (Special Education, 2007).
Given the above background, the potential of the new computer technology was predicted to bring about new experiences for teachers and students with learning disabilities. Jerome and Barbetta (2005) noted that technology had instituted itself as an essential part of special education. As a result, a number of studies have been carried out to investigate how computers and IT aid the instructional process for students with learning disabilities. Some of them include; Ae-Hwa et al. (2006), Kay (2007), Sorrell et al. (2007), Hansen (2007), Lee and Vail (2005), Hutcherson et al. (2004), Earman (2007), Ingle (2003), Jerome (2003), Cheng-Fang (2004), Mechling (2004), Ae-Hwa (2002), Mechling, Gast and Langone (2002). However, these studies were focused mainly on the traditional instructional processes such as computer assisted instruction to support academic achievement in special education.

Apart from the traditional instructional uses, some students use technology in the form of assistive technologies to boost or enhance their functioning in life skills. Such skills as hearing, writing, or communication may be related to the learning process. Other functional areas may be completely independent of the instructional process such as mobility, recreation, and employment. Some research papers have been written, studies have been conducted or innovations rolled out to address non-instructional disability issues, such as those by Wehmeyer et al. (2004), David et al.(2004), Marie (2002), Wehmeyer and Smith (2004), KNFB (2008) and Mitchem et al. (2007).

This study however is primarily concerned about special education practitioners and how they use IT-based resources as a tool to meet instructional challenges of their daily work. This is based on the fact that, the real IT revolution in education was actually realized after the evolution of the World Wide Web (WWW) and the Internet technology. This led to a significant impact on accessibility of information resources
and revolutionized the potential to improve the quality of education programs. As for special education teachers, the Internet technology provides endless opportunities for accessing useful resources necessary for crafting suitable special education program activities (Smith and Meyen, 2003).

Moreover, Hawsawi (2002) argued that by using computers, special teachers could gain immediate access to current information resources. Such resources were stored on compact discs, electronic databases and the Internet. This alone was an indication of just how much information was readily accessible, if special schools had the necessary infrastructure such as computers, networks and related IT facilities for teachers to utilize in their daily work.

Gardner and Wissick (2002); Edyburn (2001) reasoned and also maintained that the World Wide Web (WWW) presents unique teaching and learning opportunities that never existed before. Being able to support instructional applications via software and multimedia tools, the technology has the capability to provide both group and individualized learning experiences. Moreover, individual experiences are very essential in special education. Most students with disabilities require modifications and adaptations such as to allow extra-practice to support mastery of skills, or to employ creatively designed materials to sustain motivation for learning purposes.

Due to the consistent urgency for special education teachers to access current and up-to-date materials, the World Wide Web was increasingly being employed to retrieve supplementary resources for lesson preparation (Tinker, 2001). As an instructional tool, the WWW assists teachers in gaining access to extra information that would boost their capacity to teach. For instance, there are many websites which provide lesson plans that
are relevant and pertinent to the needs of various learners including those with disabilities. Moreover, such Websites do not necessitate Web use in the classrooms (example, http://www.teach-nology.com/teachers/lessons_plans/Special_ed/).

Information technology makes it possible to use online resources when researching and producing lesson plans. The Web has become more indispensable among both mainstream teachers and special education teachers. It enables them to use an abundance of electronic teacher resources to assemble new ideas for lesson plans. Due to the use of IT, teachers are generally much more productive as they use their time more equitably to develop most of their lesson plan ideas from shared resources (Keane, 2002)

Special education professionals may need to constantly access and manage some vital information on daily routine tasks based on the individual education programs. EDmin.com (2002) launched a Web-based resource which enables educators to improve student services by utilizing the Internet potentials. This Exceptional Student Education Service (ESE) enables professionals and administrators to identify individual student needs through shared resources. This in turn makes it easier to create unique learning programs. Teachers are able to track the effect of intervention techniques on individual students and can generate reports for each student based on the progress of the learning process.

Some Internet technologies benefit special education teachers by supporting professional development resources. Special teachers and professionals may be well trained, but it is inconceivable for them to maintain a toolbox of effective research-based instructional strategies that are large enough to meet the needs of every student
with a specific disability (Cavanaugh et al., 2004; Montague and Van Garderen, 2003; Wehby et al., 2003).

Therefore, for special teachers to be able to locate, learn, and apply a strategy with relative ease, an online database was developed from a teachers’ perspective. The design of the online database enables special teachers to access hundreds of research-based resources and strategies in many subject areas. The resource materials in the database are suitable for initial assessments, program activities, and interventions before the referral stage or during individual education program (IEP) meetings (Hodges et al., 2007).

Englert et al. (2007) conducted a study regarding the process of writing expository papers on self-selected topics by students with learning disabilities. The process requires good and careful organization and sequencing of written material. In the study, an experimental group used a web-based environment. It provided the necessary assistance by prompting students to adhere to the correct structure, ideas, themes and topical sentences. The results of the study indicated that students in the web-based scaffolding environment produced better and lengthier pieces of work demonstrated by the attributes for rating writing quality.

Skylar, Higgins and Boone (2007) advanced the concept of WebQuests as an option for guided learning activities. The concept supports students with leaning disabilities by providing a structured online environment with guided learning activities. Educators are able to use the Internet as an instructional tool and also providing the required online resources to complete a particular task. Such resources may include web documents, communication with relevant experts, and searchable databases. Since the environment
supported students who usually work in groups to accomplish a task broken down into specific steps, they could find it easier to locate the main resource materials needed to complete a task.

Lerner (2000) estimated that almost 80% of students that were diagnosed with learning disabilities had reading problems. Having access to information resources that could support a teacher in the preparation of reading materials was crucial. For instance, AdLit.org is a website that provides access to research-based articles and instructional materials for classroom teachers. This is a very essential service. It helps teachers to keep track of the latest reading techniques based on current research. It also saves time by availing samples of instructional materials to teachers thus helping them to improve the quality of reading program activities (WETA, 2007).

Samuels (2006) described a research project which benefited special education professionals in real practical terms. The web-based resource makes research-based strategies, curriculum resources, interventions and methodologies readily accessible to those teachers who need them for classroom application purposes. Initiated by The National Dissemination Center for Children with Disabilities, the website provides valuable information resources required for practical instructional issues. The sole aim of the website is to provide a wealth of resources accessible to special education professionals. Moreover, the resources are presented with circumstantial evidences indicating their preferred practical applications and dimensions for suitable program activities.
1.2 Information Technology and Special education

It is important to note here that information technology (IT) has the potential to contribute to curriculum and program activities in many ways. In the first place, computers provide a new dimension with current vibrant ways of learning and also save teachers' instructional and preparation time (Lee and Vail, 2005). Special education teachers can collaborate and communicate with their peers (Donlan, 1998) through the cyberspace while IT provides them with alternative resources and strategies to individualize lessons and activities (Coughenour, 2002).

At the same time, special education teachers can search and gain access to research, online experts and many curriculum resources (Barron and Ivers, 1998). Secondly, IT has the potential to play a significant role in the education process of students with learning disabilities (Jerome and Barbeta, 2005), especially when used as a supplement to the traditional instruction process (Hall et al., 2000). Moreover IT provides an effective mode of instruction and could be used to generate instructional materials necessary for early academic skills (Hitchcock and Noonan 2000). Due to continued research and innovation in information technology, more efficient software programs have been created and put to use in special education for various instructional purposes. Probably online databases for evidence-based instructional strategies for teachers of students with learning disabilities is another development with lots of potential (Hodges et al., 2007) Moreover, electronic products and computer software systems have evolved to become smart, adaptive as well as capable of personalizing the instructional process for specific learners (Braddock et al., 2004).

However, it was revealed through informal conversations with fifteen (15) special education program coordinators from the Klang Valley areas that although the
Multimedia Super Corridor (MSC) project (an information technology physical infrastructure hub) was in place, the majority of the local special education professionals did not seem to maximize IT-based resources to impact and improve special education program activities.

The MSC is important to Malaysia because it is expected to accelerate Malaysia’s entry into the information age. In order to become scientifically developed and socially progressive, the country’s leadership has developed plans to enable Malaysia to transform into a fully developed nation by the year 2020 (Mahathir, 1991).

1.3 Statement of the problem

Information Technology continues to penetrate each and every aspect of our society. This is partly due to the fact that, the past three decades have witnessed unprecedented growth in the capabilities of computer technology (Serfass and Peterson, 2007). Yet in certain cases available research in teacher education indicates that most teacher trainers have not mastered the use of basic IT applications (Ragbir, 2003). Also, neither pre-service nor in-service teachers have kept pace with the rapid changes in technology developments (Bansavich, 2005). Generally, available research on teacher education over the past two decades seems to confirm that even the future teachers are probably not being properly prepared to serve in an information society (Duffield and Moore, 2006; Bansavich, 2005).

Sven (2006) noted that there was a general lack of satisfaction with IT skills among the teachers themselves in his qualitative study which focused on newly certified teachers’ use of information technology. He explained that a number of newly trained teachers expressed a desire and wished they had more knowledge and skills about information and communication technologies and related techniques. Moreover, a recent study
conducted by UNESCO (2008) confirmed the findings by Woo (2003) that teachers generally lack ICT skills necessary to integrate technology into classroom activities, and relevant professional development programs. Hence some teachers were unable to utilize ICT tools for the benefit of their students.

Probably another part of the same problem here is that the traditional methods of curriculum design for teacher education do not consider changes that may take place before actual implementation. Yet as Brugman (2004) indicated, a four to seven year time lag is the normal period for the process of curriculum revision. In the case of computer technology and applications, the process for curriculum revision takes too long to allow an accurate computer education program for pre-service teachers in general.

Meanwhile a review of the literature by Shazia (2000) on factors affecting teachers’ use of information and communication technology indicated a negative perspective. Findings of some other recent studies (Franklin, 2007; Yidirim, 2007) outlined lack of timely technical support, lack of time in daily schedule, inadequate in-service training, lack of strong leadership, a tyrannical school curricula, lack of incentives and lack of collaboration among teachers. The same findings were echoed by Vias (2005) who as a program coordinator of a special school in Petaling Jaya detailed the same barriers to IT application. As part of the research problem therefore, it was important that part of the focus of the study attempted to examine some of the relevant factors affecting teachers’ use of IT in Malaysian special schools.
The dimension and nature of the research problem was further strengthened when the researcher met and discussed with three Malaysian special education teachers who had worked in Singapore for more than ten years led by Josephine (2004). They highlighted and shared how the process of managing barriers to IT integration in Singaporean schools was being carried out.

There were some similarities in both how the Malaysian and Singaporean special education teachers detailed their plight regarding the use of IT in meeting the unique instructional needs for special children (Evans, 2005). Furthermore, other available evidence indicated that in general, skilled and experienced special education teachers with the required knowledge and competencies in information technology are scarce at the moment (Sharipu, 2009). It is the duty of institutions of higher learning to provide courses that fulfill the long-term demands of this category in the educational human resource sector. The scarcity of IT knowledge and skills among special education professionals that can enable them to benefit from IT-based resources while dealing with special education programs is a critical problem. Despite the growing number of students taken in by the Faculties and Departments of Education in the local universities to prepare them for service in this emerging information and wired society, questions arise whether they were given the appropriate orientation and knowledge required for the job.

Faizal (2007) observed that for example, at University Kebangsaan Malaysia (UKM), the teacher training program for a bachelor’s degree in education with honors (special education) did not cover computer or IT-related subjects in its major courses. It was unclear how the recommended minor courses from the faculty of technology and information science were selected to ensure that their graduates
were equipped with the desired IT skills and knowledge for special needs. To produce a new breed of special education teachers, there is a need for teacher training institutions or faculties to continuously review their curriculum, emphasizing the relevant IT components.

Based on these reasons, a study on the use of IT in meeting instructional needs for special education program activities was necessary. The lack of a formal study to combine and address the main instructional needs for special education teachers, required IT skills and knowledge, as well as the barriers to IT usage; makes it difficult for policy makers, teacher training curriculum planners and authorities in this field to rethink and refocus the direction of special education programs for a better future (Evans, 2005). Moreover, the need to address special education programs from the IT perspective is of utmost importance now than ever before.

1.4 Purpose of the study
The overall and main purpose of the study was to investigate the use of information technology (IT) in the process of meeting instructional needs for special education program activities in special schools or learning centers.

This was achieved by first of all exploring and examining the main curricular or instructional needs that special education teachers needed to address in order to meet the challenge of executing their daily responsibilities. Secondly, the study set out to identify and analyze the current situation regarding computer and IT knowledge levels among special education professionals.
The study also sought to examine IT-related competencies required by special education teachers to meet the unique needs of working in special schools. This was in line with the endeavors to improve the education and training of special education teachers so that they could become more qualified, skilled and relevant to the jobs in an information society (Ninth Malaysia Plan 2006 – 2010, 2006).

The third purpose of this study was to investigate what special education teachers perceived as favorable factors or barriers in their attempts to employ IT-based facilities or services to seek or access desired material resources for instruction and program activities.

1.5 Objectives
The main objective of this study was to investigate and evaluate the use of information technology (IT) in the process of meeting instructional needs for special education program activities.

The specific objectives of the study were as follows;

a) To explore the main curriculum domains for special education teachers' instructional needs.

This would help to describe the sphere and realms about which special teachers’ information searching patterns revolve.

b) To identify and analyze the current level of computer and IT knowledge among special education professionals.

This would help to explain how special education teachers’ current IT knowledge affected the use of IT-based resources to access information for unique instructional and program activities.
c) To examine how special education professionals use their current level of computer and IT knowledge to meet their instructional needs.

d) To investigate what special education teachers perceived to be facilitators or barriers in their attempts to use IT-based resources for the purpose of generating information and resources for program activities.

This would help to clarify the nature of such facilitators or barriers to the use of such resources whether in terms of say lack of knowledge, facilities or physical infrastructure.

e) To examine IT-related skills and competencies required by special education teachers working in special schools.

This would highlight what special teachers regarded as essential skills and knowledge in the application of IT facilities and services to accomplish their regular tasks, duties and responsibilities.

1.6 Research Questions

In order to achieve the above objectives, this study was guided by the following research questions.

1. What are the main curriculum domains for special education teachers’ instructional or information seeking practices?

2. What is the current level of computer and IT knowledge among special education teachers?

3. How do special education teachers use their current level of computer and IT knowledge to meet their instructional needs?

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?
5. To what extent are some IT-related competencies considered essential for special education professionals?

No hypotheses were used in this study, as all the options and avenues were left open in order to gather as much information as possible including the values, perceptions, opinions and practices of the participants. Kerlinger’s statement of measurable hypothesis as a necessary condition of scientific research was nullified when he conceded that “it is possible to conduct research without hypotheses, particularly in exploratory investigations” (Kerlinger, 1986).

### 1.7 Significance of the Study

The use of information technology in education is an important endeavor that is poised to create a lasting impact in Malaysia’s educational system. An extensive literature search found no studies on the use of IT in meeting instructional needs for special education program activities. Therefore, this study represents one of the first research efforts undertaken in this area involving; information technology, instructional needs and special education program activities. This research is considered to be important because it addresses a void in scholarly literature regarding the current level of computer and IT knowledge among special education teachers, the desired IT skills and competencies and what they consider as barriers to the use of IT. It is hoped that the statistical data resulting from the study in addition to the data collected from interviews and observations together could provide some guidelines and suggestions, and the results of the study could be of benefit to the parties concerned.

A second major significance of this study is that it could contribute to knowledge on the desired IT knowledge, skills and competencies for special education teacher graduates. The list of skills and competencies and other findings from the study could provide an
invaluable input to the Teacher Training Institutes or Faculties of Education regarding curriculum development content. The IT skills and competency ratings identified in this study could assist curriculum planners in curriculum development and design. The skills and competencies rated as the most important in this study could suggest a foundation for the structured core curriculum, which would be responsive to the changing demands of job responsibilities in special education schools. The curriculum could be adjusted and improved so that it could incorporate new elements, which would produce graduates who are able to cope with the challenges of the current instructional needs in special education.

The study could help to identify and assess the professional preparation knowledge, skills and competencies that could be included in the curriculum for pre-service as well as continuous professional development programs for teacher graduates. This might be particularly relevant for those aspiring to integrate information technology in the teaching of students with learning disabilities.

This study could also provide the required knowledge on those factors which facilitate the use of IT-based resources among special education practitioners. Such knowledge could be used to overcome barriers to the use of IT facilities in special schools. Furthermore, the knowledge could also be used to plan the right management strategies which could create a suitable environment for nurturing IT skills among all the staffs.

The identification of IT skills and competencies could enable the relevant authorities in the teacher training institutions to establish an objective framework for the development and design of education and training programs. Such skills and competencies could also provide guidelines for deciding appropriate education and training methods as well as
levels for new intakes of teacher trainees. The identification of desired IT skills and knowledge could also assist in developing specialized fields within the teacher education and training departments and faculties. The curriculum could be assessed and evaluated against validated sets of information access skill competencies (Rehman, 2000).

The study could provide important information for the Ministry of Education, policy makers in the universities and teacher training institutions, especially for the module on instructional technology. Alternatively, collaborative efforts or teamwork strategies could be initiated in formulating approaches for the development of IT knowledge and skills among special education pre-service and in-service teachers.

The findings of the study could also lay some recruitment procedures for potential employers. Such a development could in turn provide a strong base for manpower planning in this field. Suggestions for appropriate actions would ensure that future special education teachers are equipped with the necessary knowledge, skills and qualities to carry the profession forward.

This study could also create some awareness on the use of computers and IT-based information resources which provided the opportunity to access data which was urgently needed by special education teachers. IT-based resources provide the potential to locate, acquire, organize and use the full range of information resources to constantly revise and create a curriculum which could be in line with current research, thinking and application. The use of IT facilities to collaborate and share valuable knowledge with experts in the field could result in developing up-to-date program objectives and activities that are relevant to the needs of students with learning disabilities. If such a
development takes off, it could lead to a dynamic trend like in other professional fields, whereby speedy changes and adaptability to new ideas would become the professional way of life for special education personnel as well (Brugman, 2004).

The significance of this study also lies in its potential to provide some alternative information sources and services for special education teachers. A part from the conventional information sources (especially print media) and some audio-visual sources, this study provides ideas on some IT based resources especially on the Internet and other web based sources and services. The literature in the study also provides insights and experiences as to how children with learning disabilities respond to research based strategies being executed elsewhere.

Finally, this study could provide some baseline information for researchers willing to engage in future studies on curriculum development issues and for equipping special education teachers so as to be relevant in an information society. The findings obtained in this study could contribute to a body of knowledge combining information technology, instructional needs and special education program activities.

1.7.1 Rationale

Malaysia is a host to one of the most ambitious information and communication technology projects known as the Multimedia Super Corridor (MSC). In tandem with this development, various educational projects such as the smart school project are being pursued. Therefore, for a country poised to become a fully developed nation by the year 2020 (Mahathir, 1991), it is important to explore and assess its manpower competency levels and needs in terms of IT skills, knowledge and experiences. Special education teachers are among those manpower groups that face a lot of challenging
situations in the process of executing their responsibilities, yet some of the challenges could be overcome if IT-based resources and services were carefully utilized in the process.

Teacher training institutions and education faculties in Universities should develop curriculum models that are compatible with the demands of the special education teachers’ job in an information society. Therefore, the teacher training curriculum goals should include relevant IT component skills and knowledge needed by special education teachers to access information and instructional materials from the available IT-based resources for diverse instructional and program purposes. Teacher trainers should master the innovative technologies so that they would be able to direct their students to use them (Ragbir, 2003)

1.8 Definition of Terms

The basis of definitions of terms in this section was derived from a variety of sources. However, the meanings of the various terms were slightly adapted for this research, but making sure the original meanings were retained to serve as operational definitions in this study.

**Information technology** is used in the study to mean all computer related hardware and software programs, peripherals and networks that help special teachers / educators to meet their information needs with regard to instructional and program activities. Otherwise also defined as the scientific technological and engineered management techniques applied in information handling and processing (Mathew and Vijayakumar, 2006). However, for this particular research, the main information technology components considered include; computer related hardware and software programs,
networks, the World Wide Web, online databases, e-mail communication, newsgroups and electronic journals.

**Skills** are the ability to use one’s knowledge effectively (Griffiths and King, 1986)

**Competency** is directly related to performance, effectiveness of performance and the value of the performed work. The capacity to cultivate competencies is derived from education, training and experience (Rehman, Majid, and Ahmad Bakeri (1998b). In short, competency is summed up as the ability to do something or some work to a level that is acceptable and satisfactory.

**Information needs** is used here to mean any useful piece of practical knowledge, advice, recommendation or suggestion required or deemed necessary by special teachers / educators to come up with sound decisions on any given aspect of the individual education programs (IEPs), special activities, curriculum, programs and projects. (Lynn, 2001).

**Instructional Needs** is a concept used in this study to reflect what is comprehensively understood to mean conditions which require a set of strategies and resource materials during the teaching process. Such a combination is tailored to address the needs of specific students with unique learning disabilities. Instructional needs could be in the form of poor reading skills, or inadequate social skills (adapted from: Elizabeth, 2006)

A **special school** is a term employed in the study to mean a unique learning environment for children with distinctive mental or behavioral features and characteristics requiring certain particular methods of instruction by specially trained
personnel. This environment helps students with learning disabilities to acquire functional skills that help them to live in society as independently as possible (adapted from: Copenhaver, 2004).

**Special education** is a form of specialized instruction that is tailor-made to fit the unique learning strengths and needs of students with learning disabilities. A major goal of special education is to teach the skills and knowledge a student needs to be as independent in daily life as possible (adapted from: Copenhaver, 2004).

**Learning Disability** is a characteristic or feature which refers to one or more of the basic psychological processes required in understanding or utilizing spoken or written language, which may reveal itself in an imperfect ability to speak, read, write, listen, think or spell or even do mathematical calculations (Copenhaver, 2004).

A **program activity** is described as a formulated plan outlining things to be done or to take place especially in a specified order. Such a plan provides the basis of an instructional procedure for students with learning disabilities designed to stimulate their mind through learning by first hand experience (adapted from Merriam-Webster, 2006).

**Special Education Teachers** are a group of trained and self-disciplined individuals possessing unique skills derived from training or education, and prepared to utilize those skills in teaching students with learning disabilities. The main goal of special education teachers is to assist students with disabilities in acquiring functional skills. Such skills are necessary in enabling such students to lead teenage and adult independent lives (adapted from Rollin, 2007).
**Special Children:** is used in the study to refer to children with unique features and special characteristics including down syndrome, autism, mental retardation, attention deficiency disorder (ADD), attention deficit hyperactivity disorder (ADHD), emotional instability and behavior problems. According to Encyclopedia Britannica Online, special children are usually different in terms of social, mental or physical aspects from the average to the extent that they require modifications of usual school practices (adapted from Encyclopedia Britannica, 2006, available online at: www.britannica.com)

**Curricular Domains:** is used in the study to refer to a set of instructional areas designed to help special children to learn independent living skills and develop a near complete functional personality. They include; fine motor, gross motor, adaptive (self-help) skills, cognitive skills, communication skills and social skills.

**1.9 Scope of Research Study**
This study was intended to investigate the current IT and computer knowledge levels among special teachers / educators, and how they used it to access information for program activities. It also highlighted some of the barriers with regard to the use of IT and computers in special schools, and the suggested IT-related competencies for special education teachers.

a) This study was conducted in and restricted to special schools or special education centers located in the geographical area of the Klang Valley region of Malaysia

b) This study was restricted to schools associated with serving children with unique features or special characteristics which included down syndrome, autism, attention deficiency hyperactivity disorder (ADHD), behavior problems, mental retardation, and emotional disabilities.

c) The selection of schools for this study was based on the medium of
instruction, including English and Malay languages. Schools that used any other language as a medium of instruction were not included in this study.

d) The schools included in the study were not selected on the basis of random sampling. Thus, the results of the study should be generalized to other schools or states in the country with caution. However, a few lessons could be learned by some schools.

e) The study did not attempt to evaluate the quality of the schools included in the sample.

f) The study could have been limited in one way or another by the researcher’s inability to speak the Malay Language. Interpreters were used during the direct interview process where those being interviewed did not speak English at all.

g) The schools that were included in the study were those with computer facilities or whose staffs were computer literate and had access to computer facilities.

The primary participants included in this study were teachers, or education staff with the responsibility for day to day teaching and curriculum or instructional design responsibilities in special schools. These individuals were identified by a combination of preliminary information drawn from the Selangor State Council of Social Welfare Office, personal knowledge of some special schools or from information provided by the directors, principals or other chief administrative officers of some schools.

A total of 120 respondents participated in the study. They included 100 teaching and education staff members from fifteen (15) special schools or education centers. Among them, 20 respondents were individuals identified as parents (of special needs children)
or professionals (such as therapists, psychologists) dedicated to the application of information technology in special education.

1.9.1 Limitations

The study focused on the use of traditional IT facilities, not the more recent web 2.0 Internet social networking technologies, for instance facebook, myspace, twitter, blogosphere etc. The implication here is that probably the latest IT facilities have greater potentials to benefit special education teachers.

The study was conducted in the state of Selangor Darul’ Ehsan only. The implication here being that the findings may require cautious and careful consideration before being generalizable to other states.

1.10 Summary of Chapter

The earlier section of this chapter explains the background of study and introduces the use of information technology in special education. This is followed by the explanation on the statement of problem under study, the main objectives, research questions, significance of the study, rationale, definitions of terms and scope of research. Chapter 2 examines the benefits of information technology to instruction, and reviews studies that have been done on information technology and special education in general. It also covers the aspects of computer assisted instruction in special education, barriers to computers and IT use in special schools and IT-related competencies desired or possessed by special education teachers. Chapter 3 discusses the research design, the instruments used, and how the data is collected. Chapter 4 presents the findings where data is analyzed and interpreted.
Chapter 5 summarizes the entire research by looking back at what has been done to achieve the stated objectives of the study. It discusses and derives suggestions from the findings and recommends the areas of future research. Finally, it provides concluding remarks on the whole study.