Chapter One

INTRODUCTION TO THE STUDY

Malaysia enters a new millennium with the dawn of the Nation's Vision 2020. One of the most important vehicles in the realisation of the nation's development agenda is information technology (IT). This importance is reflected particularly in the proposed implementation of IT in schools throughout the country (Seventh Malaysia Plan 1997).

A key factor in Malaysia's economic development has been the five-year development plans, beginning with the First Malaysia Plan (1966-1970). In the implementation of the Sixth Malaysia Plan, RM6 (1991-1995), substantial investments were directed towards laying the basic IT infrastructure. The focus on developing the infrastructure has been followed through in the Seventh Malaysia Plan (1996-2000). This is reflected in the increasing expenditure on IT, innovative products and services in the market place, new infrastructure development programmes - the Multimedia Super Corridor (MSC), and most of all, greater sophistication of ideas flowing from both government and private sectors (Seventh Malaysia Plan 1997).

The realisation of the potential of IT has resulted in the IT infrastructure being expanded with the implementation of a number of national IT-related programmes and projects aimed at accelerating the wider use of IT in the various

sectors of economy. The facilities made available brought about increased usage of IT in both the public and private sectors improving efficiency, productivity and overall economic competitiveness. Reflecting the importance of IT to the nation's development plan, the National Information Technology Council (NITC) was established in 1996. The NITC comprises members from public and private sectors, directing a formal and concerted effort with regard to IT policy and programmes and is instrumental in consolidating the IT plan that was initiated in the RM6 (Seventh Malaysia Plan 1997).

One of the most significant landmark in the nation's adoption of IT was the establishment of the Joint Advanced Research Integrated Networking (JARING) in 1991. JARING was an extension of *RangKom*, a small computer network developed under the Fifth Plan. It serves as the local gateway to the Internet, promoting information exchange and database development through access to the Internet at affordable costs. The number of JARING subscribers increased rapidly from 30 in 1992 to 14,400 in 1995 and the number of users of the Internet too have correspondingly increased to an estimate of 43,200 in the year 1995 (Seventh Malaysia Plan 1997). The various uses of the Internet globally is as shown in **Figure 1.**

The task to oversee and implement JARING was given to the Malaysian Institute of Microelectronics System (MIMOS), initially under the Prime Minister's office and later transferred to the Ministry of Science Technology and Environment (MOSTE). MIMOS has now been corporatised as MIMOS Berhad. By the middle of the 1990's, Internet accessibility became popular amongst

Malaysians. JARING was unable to cope with the increasing demand. As a result, MIMOS initiated several programs to enhance Internet accessibility and add value to existing services. One of the programs was to appoint independent Internet Service Providers (ISPs). By 1997, other ISPs such as TM-Net had evolved.

Figure 1

The Various Uses of the Internet (Source: INET '97)
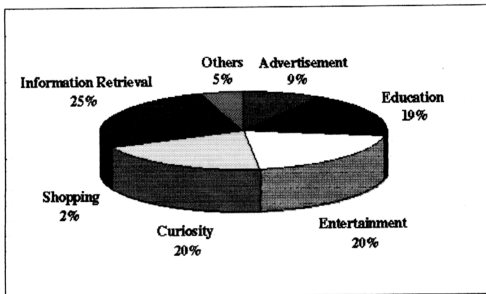
The Development of IT in the Education System

MIMOS was also directly or indirectly involved with the Ministry of Education's (MOE) computerisation programs in schools, such as The Computer Literacy Pilot Project (CLPP), the development of the "Atom-1 PC", "*Sistem ComIL*" and "*Jaringan Pendidikan*" (Education Network). In 1986, the MOE set up a joint committee with MIMOS to study and make recommendations for IT

implementation in schools. The outcome was a Computers-In-Education (CIE) Policy in 1989, which proposed the shift from teaching computer literacy to the widespread use of computers as an integral part of teaching-learning across the curriculum (Gan 1997).

In the field of education, programmes that give students exposure to basic computer literacy knowledge were launched. In 1994, fifteen primary schools in the State of Selangor were selected for a pilot project involving computer-assisted teaching and learning. The programme was for students of Standards IV, V and VI, utilising computer software for Mathematics and the English language designed by the Computer Technology Laboratory (Makmal Teknologi Komputer, MTK) of the Ministry of Education. A computer literacy project was also launched for the secondary level. Students of Forms I and II from sixty secondary schools in the rural areas were introduced to computer applications such as database, spreadsheet and word processing. Students in secondary technical schools were also taught designing and programming using software such as CAD/CAM (Seventh Malaysia Plan 1997).

Besides developing computer programmes for learning and teaching purposes, schools were also encouraged to set up computer clubs as part of the co-curricular activities with co-operation of the Parent-Teacher Association (PTAs) and the private sector. In 1994, the computer literacy programme was also introduced into teacher training colleges, which made computer courses compulsory for all its trainees (Seventh Malaysia Plan 1997).

In 1994, *Jaringan Pendidikan* was introduced as a pilot project involving fifty secondary schools (Seventh Malaysia Plan 1997). The project networked the schools and connected them to the Internet, with an aim to facilitate communication and interaction between students and teachers, giving them access to educational information both within and outside the country (See **Figure 2**).

Local universities and training institutions have also developed computer networking with linkages within and between campuses and access to the Internet. A study is presently being carried out to develop the Education Management Information System (EMIS) which will result in computer networking within the Ministry of Education and with the various state education departments, teacher training colleges, state education resource centres, teacher activity centres and schools (Seventh Malaysia Plan 1997).

Figure 2

The National Education Information Network (Jaringan Pendidikan).
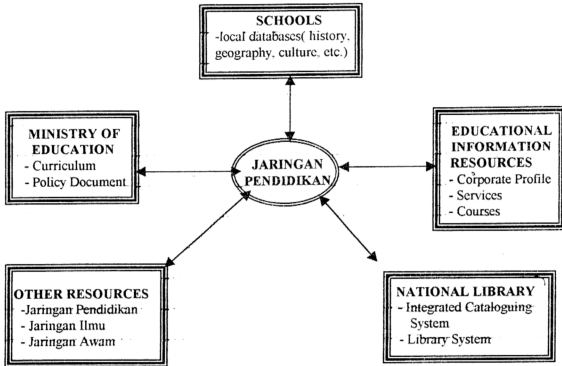
The development of IT in the field of education has been very rapid over the last few years, with the announcement by the Minister of Education for the establishment of various institutions offering IT related studies. To name a few, *the 'Sekolah Bistari'* (Smart School) project, the Multimedia University and University of Telecommunication (UNITEL) (Computimes April 23 1997). The existing institutions of higher learning too, have made way for the setting up of new courses in line with the government's aspiration to create a nation *'fully developed'* (Mahathir 1991) by the year 2020. Public corporations such as Tenaga Nasional Berhad (TNB) and Telekom Malaysia Berhad (TMB) also conducted courses at the tertiary level focusing on engineering and information technology.

The landmarks in IT introduction to Malaysian schools are summarised in **Table 1**.

Table 1 gives us an overview of the rapid changes that have occurred in the education sector over the last few years. However, from newspaper articles and conversations with teacher colleagues, these changes appear to worry the teachers. There is much anxiety and confusion expressed by them, fearing that one-day their role would be replaced by technology. This is confirmed by Bennet (1996) as "there lurks a high degree of confusion and apprehension about the future potential of IT in the field of education and training".

The emphasis on IT has consequently brought about the need for more IT-related skilled personnel especially in the areas of system development and engineering, operations management, consultancy, training, research and development, software development and database management. The span of the Sixth Plan revealed a shortage of 7,008 IT-related manpower (See **Table 2**). During the Seventh Plan period, concerted efforts are being made to strengthen the foundation for building a knowledge-based society and economy. To attain this goal, major initiatives will be undertaken with the thrust of IT development on: -

"... expand[ing] IT education and training in line with the anticipated demand for IT-related skills, knowledge and expertise..." (The Seventh Malaysia Plan 1997).

Table 1

A Summary of Landmarks in IT Introduction to Malaysian Schools.

Year	Project	Notes
1981	School computer clubs were first set up.	S.M. La Salle in Petaling Jaya was the first school to do so.
1986	Computer Literacy Pilot Project (CLPP)	Form four students from 20 schools from all over the country were involved. Project discontinued after one year.
1989	Computers-In-Education (CIE) Policy proposed.	An MOE-MIMOS joint committee drafted the policy. It earmarked the shift from teaching computer literacy to widespread integration of computers in the teaching-learning process across the curriculum.
1990	-Launching of the Atom-1 PC compatible. -A Computer Integrated Learning System (ComIL) was developed.	-The PC was designed and produced locally to provide for a cost-effective and functional school computer. -This software has basic tools and functions for generating educational materials for teaching and learning tailored to the local curriculum objectives and written in Bahasa Melayu.
1992	CIE Pilot Project was launched by the MOE.	A new Computer Literacy syllabus was introduced to forms 1 and 2 students from 60 selected schools. Each of the schools were equipped with 20 Atom-1 PCs that were networked with a powerful server.
1993	Knowledge Resource Centre Project (Psi) was given the MOE's blessings.	Developed by a private company, Rangkaian Tenaga Sdn. Bhd. The project involved setting up an electronic library system in each of the secondary schools with a minimum of 700 subscription-paying students. Project failed and shelved indefinitely.
1994	Computer-Assisted Instruction/Learning (CAI/L) Project was launched.	Involved 15 primary schools to help improve pupils' achievement in arithmetic and English through CAI. Courseware used was developed by MOE using Linkway or the ComIL System.
1994	*JaringanPendidikan*(Education Network) was launched.	Internet Project where 50 pilot schools were installed with Internet connections.
1996	Pusat Sumber Elektronik (PSE) also known as *Rangkaian Munsyi*, was launched.	Another Internet Project implemented in 14 other selected pilot schools. Telekom Malaysia contributed to the computer network.
1996	Smart Schools Project announced	Announcement made by government in September to embark on this project.

Table 2

Output and Demand of IT Manpower, 1991-1995 (Source: Seventh Malaysia Plan 1997).

	Number
OUTPUT	**20,166**
Public Sector	**10,166**
Universities and Colleges	*6,520*
Degree	3,141
Diploma	3,379
Polytechnics	*3,646*
Diploma	885
Certificate	2,761
Private Sector	**10,000**
DEMAND	**27,174**
Public Sector	3,042
Private Sector	24,132
GAP (Output less Demand)	**-7,008**

The development allocation for education and training for the Seventh Plan is RM10,098.8 million, an increase of RM2,000 million. Education and training programmes are expected to produce manpower that is knowledgeable, highly skilled and computer literate. The private sector will be an active partner in all the Government's endeavours to achieve this goal (The Seventh Malaysia Plan 1997).

The role of telecommunications will undeniably be of utmost importance. Yet at this very stage, there appears to be some hitches in providing an efficient service by the authorities concerned as depicted in the numerous complaints appearing in popular local newspapers. Ultimately, the question may arise –

"...what is the point of having state of the art technology when service is poor?"
(New Straits Times June 11 1997, p12).

Present Scenario

To date, Malaysian schools have no guidelines available to follow for the implementation of IT. This was confirmed by Puan Ainon Hashim and Puan Kasma Muni Che Hassan who are the *Ketua Penolong Pengarah, Pusat Sumber Pendidikan Negeri* (Principal Assistant Director of the State Educational Resource Centre) for Wilayah Persekutuan and Selangor respectively. A lot of important decisions lie on the shoulders of the school leadership and the media teachers or a committee formed by teachers, friends and parents of the school who are proficient in the use of computers. This implies that there is no standardisation within a school and also between schools with regard to the purchase of hardware or software to be used.

Often, there is a lack of or little planning before IT implementation about what hardware specifications to install, which software to purchase, or even how to be wired on the Internet. Most schools that implement IT are just "jumping on the bandwagon" (Geisert and Futrell 1995).

The percentage of Malaysian teachers who are computer literate is small though increasing at a slow rate. A majority of teachers have never used computer application software such as spreadsheets, databases or even word processing. The main reason being the unavailability of computers in their schools, or if they were available, the computers were inaccessible, as they are most likely to be used for

the school's administration. The constraints and conditions put forth by the government for teachers to be eligible for personal computer loans too impede the process of enhancing computer awareness amongst teachers. Those fortunate enough to have access to computers be it their own or that of the school, are not given any form of training in using them for teaching in the classrooms. Reliable sources within the MOE confirmed that the teachers who are computer literate are not formally exposed to the potential of IT use in their classroom.

Furthermore, in most schools where computers are available, there are no trained personnel to handle maintenance when computers break down. Schools tend to rely heavily on the computer shops from where the computers were purchased for technical assistance and maintenance. Some of the computer dealers, who are eager to make sales often wash their hands off, of this responsibility. This will result in longer downtime for the computers. Thus, there is lack of trained "peopleware" i.e. trained teachers and maintenance staff, to carry out the IT implementation process which is an "ongoing process".

Most schools with IT have no proper planning on its use for the teachers and students alike. Schedules need to be drawn up and adhered to, to ensure equal access to the computers for all teachers and students. This procedure is not as simple as it sounds. It would be a difficult task to try to fit in a schedule for everyone if the number of computers is not sufficient or the teachers themselves are reluctant to use them due to various reasons (Fisher 1996).

At present, the priority of the *Pusat Sumber Pendidikan Negeri* (State Education Resource Centres) throughout Malaysia is on the development of

multimedia software. Groups of teachers from the various states undergo courses in multimedia production conducted by the Ministry of Education at the University Putra Malaysia. These chosen teachers are expected to produce the storyboard for the software within a stated time interval. The completed storyboards will then be outsourced to private companies for production of the hard copies.

Need for the Study

The Seventh Plan foresees advancements in IT to have a significant impact on the nation's development process and the population's lifestyle. In this light, a lot of emphasis is put on the role of education. The implementation of IT in Malaysian schools is inevitable. For this, many questions need to be addressed. They include: At which level of a child's educational process should IT be introduced? How will IT be implemented in schools? When and how will training of implementers start? What hardware standards should be adopted for a nation-wide implementation process? What software should be used to fulfil the needs of the well-planned national curriculum? Where will funding for these projects come from? Will there be equal access to this expensive technology for all, regardless of geographical barriers and economic background?

With the realisation for the importance of IT application in the field of education, it is imperative to outline some if not all, previous problems faced by IT implementation in schools (Zoraini 1985; Lai 1993). The awareness of these problems can contribute to a smoother and more effective implementation program. Proper channelling of financial and human resources can be executed to

ensure no wastage and the ultimate goal of arriving at a " fully developed" nation will be achieved quickly. The choice of technology to adopt for implementation in Malaysian schools is important, as IT in itself is volatile and evolving, ever changing and improving.

Many studies conducted in America such as those by Bialo and Sivin (1990) and Collins (1991) have shown positive major findings related to IT use in education. In their studies, the benefits of successful IT implementation in schools in particular were outlined. More recent studies carried out in various parts of the world, such as those of Quinlan (1997), Kim (1996), Sterling (1996), Brickner (1996), Winches (1995), Carroll (1995), and Bauder (1994), have identified many factors that inhibit as well as factors that promote the IT implementation process. These factors were documented isolatedly. However, the ultimate question of how to *successfully* implement IT in schools was not discussed in any of the mentioned studies. The answer to this question has yet to be composed and documented.

Gan (1997) strongly views that the initial stages of the implementation process should be executed after thorough planning by the authorities concerned. Lessons should be learnt from mistakes of others who are well ahead in their IT implementation.

The need for this study hence arises; to identify, analyse and organise all the factors affecting IT implementation in schools into various aspects so that they can be given due attention and then integrated into practice. From this study, it is hoped that well-planned guidelines for school authorities, local education authorities or other related organisations in their venture to set up IT for use in the

education process, will surface. It is also hoped that some form of awareness amongst teachers regarding their participation in the IT implementation process will be instilled.

Research Problems and Subproblems

Many studies regarding the implementation of IT in schools have been done. For instance, Kim (1997) in his study of the Korean Educational Policy noted that despite a series of governmental policy efforts, there exist gaps in the implementation of computer education initiatives between the policy makers and implementers. Wilson (1997), in his study of teachers' perceptions toward 21st century technology implementation in the Shelby County Schools of Tennessee, found that prior computer knowledge, suitable software availability, teacher training and sufficient state-of-the-art equipment exerted great influence on the implementation process. As reiterated by Honan (1996), today's technology, if used differently, could bring advances that would improve education dramatically – illiteracy would be eliminated, ordinary students would make massive gains, and restraints on bright students would dissolve. If computers are to be effective in schools, however, major changes must occur, and that always frightens many people. Opposition is therefore inevitable.

Quinlan (1997) in his study of the implementation of computer technology from both district and school perspectives, identified the lack of resources, particularly in equipment and inservice teacher training, to be the main barrier to technology implementation. It is inevitable that some human instructors will object

emotionally, fearing that more extensive employment of technology will seriously degrade their position. Their trepidation is understandable but groundless. Although teachers will have to alter their accustomed practices, they will reach a new level of importance, will accomplish more, and will have greater job satisfaction when schools take advantage of the power of computers.

Carroll (1995) and Sterling (1995) too have outlined in their research findings various factors, which formed barriers to computer technology utilisation in schools of America. Many other researchers have pointed out isolated factors found to inhibit and also factors that encourage the IT implementation process.

However, no work appears to have been done in gathering and composing all the related factors, be it positive or negative, that affect the IT implementation process. This study aim at establishing and identifying the factors that help as well as impede the process of IT implementation in Malaysian schools. One of the objectives of this study was to look into the perception of media teachers and school administrators, primarily the principal's role, toward the use of IT in their schools and classrooms. The researcher investigated the current status of equipment as well as utilisation of technology in their schools. The main objective was to find out factors that are foreseen as obstacles as well as factors that could facilitate the successful implementation and use of information technology in their respective schools.

The researcher also examined the curricular impact of IT as viewed through the **three pressures** (Cerych 1985) and **three waves** (Sendov 1986). The

three pressures refer to the key factors in the education-IT 'interface'. They are referred to as "pedagogical", "sociological" and "economic" pressures.

The pedagogical aspect of education-IT "interface" rests on the nature of IT being *interactive*, hence its utilisation as a learning tool. The availability of software with this capability can increase active student participation, thus making the learning process more enjoyable.

The sociological pressure comes mainly from parents, the local education authority such as *Jabatan Pendidikan Negeri* (JPN – State Education Departments), the government under the auspices of the Education Ministry and the international environment which is fast moving toward the effective enhancement of IT for the improvement of education.

The economic pressure comes from the "needs of industry" for prowess in IT skills. At the present moment, there exists a huge vacuum particularly in our country with regard to skill shortage. The vocational significance of IT is strongly stressed in the private sector.

Before attempting to evaluate the present stand with regard to these pressures, the **three waves** of IT situation peculiar to the schools under study must be examined. Briefly, the first wave or the initial stage is that where schools have just been *given* computers to add to their inventory whether for teaching use or otherwise not clearly stated. The second wave would best be looked at by asking the question "How to teach....?" with the aid of computers. In this stage, teachers view the computers as eye-openers in conducting their otherwise routine lessons. The final wave views the IT influence on the content and aims of education itself.

This stage is presently hypothetical and would best be described as asking the question "What to teach?" using the available IT.

This study examines the situation in the sample schools to determine the "wave" and "pressures" that brought about IT. The study also attempts to identify the problems, common or unique, in each school's situation. From here it is hoped that a basic guideline for the more effective way of implementing IT in the diversified school conditions will surface.

Delimitation of the Research Problem

At present, a lot of emphasis by the Ministry of Education is on developing multimedia courseware for use in teaching and on the availability of Internet access in schools. This study looked at Information Technology in schools as a whole. This includes the use of multimedia and the Internet in the schools. This study did not concentrate on the process of multimedia software development, which is currently ongoing and orchestrated by the MOE.

This study focused on the implementation of IT at the school level. It delved into the implementation process carried out in the respective schools, adhering to the guidelines and policies set by the schools' leadership and administration. The study did not involve the policies and implementation process and other priorities set at the ministerial level. Hence, the factors affecting IT implementation derived from the instrument used, the questionnaire will portray a bottom-up conception of the research problem.

The schools under study are those secondary schools within Wilayah Persekutuan and selected schools in Selangor that are within the Klang Valley. Some of these schools may not have implemented IT but are working towards it. This study investigated the problems they face and the encouragement they receive in the process of setting up IT in their schools.

Research Questions

The following range of questions formed the basis of the research:

1. What is the status of technology available in the secondary schools in the Klang Valley?

2. How were computers introduced in these schools, with reference to the three waves and pressures?

3. What are the problems faced in implementing IT in these schools?

4. What are the factors that affect the implementation of IT in schools?

The inquiry into the current status of equipment in the schools gave us an idea as to the types of technology already existing in the schools, who uses them and how frequently they are being utilised. It also gave us an insight into some of the problems faced by the respondent schools in their attempt to implement IT, such as expenditure for equipment, accessibility to the equipment, teacher training in the use of equipment and its maintenance.

The implementation of IT in schools would require the availability of sufficient computers for the schools' population. In this study the researcher attempted to determine how computers first came about in each of the respondent

schools with reference to the *three pressures* and *three waves* as put forth by Cerych (1985) and Sendov (1986) respectively. The researcher also investigated the role of the leadership– the principal and the administrators, the PTA and other interested organisations, pertaining to the acquisition of computers and the implementation of IT in the various schools. The role of the media teacher and the School Resource Centre in the setting up of IT were also investigated. This included finding out how the hardware and software were purchased – who decided on the standard to adopt and on what basis.

In the attempt to find out the problems faced in implementing IT, the researcher also investigated whether there was any form of planning related to acquisition, accessibility, training of teachers to use IT in their lessons, equipment maintenance and security of the computers. The mode of funding for maintaining IT projects carried out in the respective schools under study shall be noted for use as reference by others wishing to embark on IT implementation in their school.

It is hoped that a review of related literature and answers from the open-ended questions relating to teachers' (media/library teachers and principals) perceptions of factors they foresee as impeding as well as factors that facilitate the IT implementation process, can identify the factors that affect IT implementation in the respondent schools. The researcher also attempted to document these factors systematically for future reference by those wishing to embark on the IT implementation process.

Assumptions of the Study

In this study, the following assumptions were made:

1. The respondents to this study know what is IT and are aware of the present importance put to it.

2. Each of the secondary schools have a media teacher other than the library teacher or a teacher put in charge to run the school resource centre.

3. The media teacher or the library teacher is aware of all IT related projects in the school such as those carried out by the computer teacher and the computer club, etc.

4. The media teachers were well versed in the use of technology for teaching and have been exposed to IT use in education through attendance of various courses organised by the state education departments, the Ministry of Education or other organisations.

5. The media teachers, like their counterparts in America and the United Kingdom play an important and active role in the schools' IT programme right from the initial stages of IT implementation in their respective schools.

Limitations of the Study

The data collected for this study are from secondary schools in Wilayah Persekutuan and selected secondary schools in the Klang Valley that may or may not have implemented IT. The sample and area under study is not representative of the whole country as there are places in Sabah and Sarawak in East Malaysia that do not even have electricity supply let alone computers to work with. Therefore

the problems faced by each respondent school in setting up their IT may be similar to others or unique in itself. Consequently, the methods employed in these schools to resolve their problems would differ, hence making documented generalisations with regard to the diversified conditions difficult.

The accurateness of the data collected is dependent on the precise interpretation of the questions in the questionnaire by the respondents and their sincerity in answering them. A pre-test of the questionnaire was conducted and to facilitate understanding of the questions in the questionnaire, an English and Bahasa Melayu version was issued together.

The data collected with regard to the factors affecting IT implementation were gathered from the schools' media teachers or library teachers and the Principals or Senior Assistants 1. Some of these teachers are newly appointed to their present school and hence may not have first hand information or precise information about the implementation process, especially the planning stages involved.

Definitions

The following definitions were used in this study:

1.   Information Technology (IT): It is taken to mean the combination of microcomputing and telecommunications technology that allows for the capture, storage, manipulation and retrieval of information (De Silva and Turiff 1993). IT incorporates two fundamental and complementary dimensions: the technological and the cognitive. As a technological phenomenon, IT stimulates and enables the

integration of new technologies in microelectronics, computers and telecommunications, bringing into existence an interconnected global electronic network, which facilitates the dynamic and efficient flow of information. The rapid flow of information through these networks enhances the innate value of information and knowledge, such that they can be readily and efficiently applied to the production and delivery of goods and services. This is the cognitive dimension of IT (Tengku Mohd. Azzman 1991).

2.   Information Literacy: In this Information Age where information is expanding at an unprecedented rate and enormously rapid strides are being made in technology for storing, organising, and accessing the ever growing tidal wave of information, information literacy is seen as a key competency for all students at all stages of learning (Plowman 1996). The skills of information literacy are an integral to learning across all curriculum areas. People who are information literate, are successful information users who will be desperately needed and sought after by society in the near future as they are:

"...able to add to their core knowledge and frequently do so; ...[who] use a variety of information sources and the necessary technology;...[who] are able to process the information which surrounds them; [and who] are confident in their ability to use information effectively" (NSW State Department of Education 1989).

The American Library Association Presidential Committee on Information Literacy in their final report, stated that:

"Producing such a citizenry will require that schools and colleges appreciate and integrate the concept of information literacy into their learning programs and that they play a leadership role in equipping individuals and institutions to take advantage of the opportunities inherent within the information society" (SLMQ 1991)

Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organised, how to find information – be it from a computer, a book, a government agency, a film, or any number of other possible resources, and how to use information in such a way that others can learn from them. Information literacy, therefore is a means of personal empowerment.

3.   IT Literacy: IT Literacy relates to the technological dimension of information literacy, whereby a student needs to acquire skills and proficiency in using IT systems (Tengku Mohd. Azzman 1991). It involves the abilities ranging from to switching on a computer system, keyboarding skills, right through to proficiency in the use of computer application software and the Internet.

4.   School Resource Centres: The School Resource Centre (SRC) is the Malaysian equivalent of the School Library Media Centre in the United States, and

the School Library in many countries. In the centre is housed a library as well as resource materials for use in the teaching-learning process.

5.   Media teachers: The media teachers take charge of the running of the PSS with the assistance of the library teacher.

6.   Multimedia: Multimedia generally refers to the combination of two or more communications media under control of a computer. Basically, multimedia is nothing more than an umbrella term referring to technologies that presents various combinations of graphics, text, video, audio, and animation under user control.

The next chapter presents a review of related literature, including an overview of the local IT scenario.