

CHAPTER I

INTRODUCTION

The microcomputer made its first appearance in the 1970s. Since then, computer and electronic technology has seen rapid advancement. Today, a new era – the Information Age – dominates the commercial, industrial, as well as the educational circle. With the extensive use of computers and computer networks, the amount of information exchange possible is immeasurable. The advancement in information technology (IT) has increased tremendously the capacity and speed of telecommunications, pushing itself forward as a powerful vehicle for social and economic development.

The global network called the Internet – which became prominent in telecommunications in recent years – is yet another breakthrough in the advancement of electronic and networking technology. It evolved from two major network projects – the ARPAnet and NSFnet – undertaken in the United States (US) of America in the 1960s and 1980s.

In the 1960s, US Department of Defense established a high-speed electronic network that linked together computers over great distance. This was accomplished with the assistance of the Advanced Research Project Agency (ARPA). The network was, thus, named the ARPAnet. This network was set up to deal with the security of the conveyance of information. Its early users were universities, government

agencies, and defense contractors (Ernst, 1995; Gagnon, 1994). Later, in the 1980s, the National Science Foundation (NSF) set up another network, known as the NSFnet. The NSFnet linked up colleges and universities in the US and it can be considered as the origin of the modern day version of the Internet (Gagnon, 1994; Russett, 1995).

Up to 1994, the Internet, as a network of networks, connected more than 3.2 million mainframes to each other. With these, it also linked up 35,000 small computer networks, 350,000 host computer systems, and up to 23 million individual on-line users around the world (Ernst, 1995; Gagnon, 1994).

The number of Internet users all over the world grows by leaps and bounds. A survey conducted by Nielsen Media Research in October 1995 found that there are about 24 million users in US and Canada (CommerceNet/Nielsen, 1995; "24 million surfers," 1995)! About that same time, a survey conducted by Malaysian Institute of Microelectronic Systems (MIMOS) and Beta Interactive Services revealed that there are more than 11,000 subscribers to JARING, the first Malaysian Internet services provider – far more than the 27 subscribers in 1992 (Dass, 1995; "Study: Internet users," 1995). In March 1996, there were more than 20,000 JARING subscribers, with the average of 100 new members signing up each day (Foo, 1996). A more recent report confirmed that JARING had registered 46,651 subscribers with an estimated user-base of about 138,000 people accessing the Internet in Malaysia (Dass, 1996)! Figure 1 illustrates the growing number of JARING subscribers. Up to 1st October 1997, there are 88,363 Malaysian registered with JARING and 79,084 registered with TMNet – the second Internet services provider in Malaysia – making a total of 167,447 registered Internet users in Malaysia (Vital statistics, 1997).

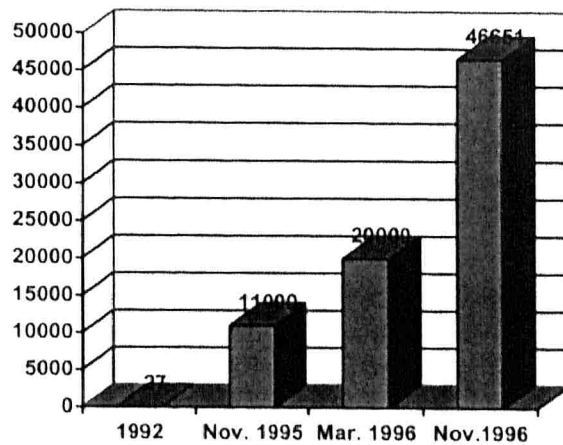


Figure 1: Number of JARING Subscribers from 1992 to November 1996

Source: Dass, 1995; Dass, 1996; Foo, 1996; MIMOS and Beta Interactive Services, 1995; "Study: Internet users," 1995.

The Internet provides various kinds of service. It is one channel through which students, parents, and teachers can improve and enhance learning. Among the facilities on the Internet are electronic mail (e-mail), newsgroup, electronic discussion group (EDG, also known as listserv group, mailing list, etc.), Gopher, File Transfer Protocol (FTP), Wide Area Information Service (WAIS), World Wide Web (WWW), Telnet, Internet Relay Chat (IRC) and so on. These facilities/tools enable students, parents, and teachers (human) to interact with the computer network (machine). Ellsworth (1994, p. 8) listed down the human-machine combination options possible on the Internet and the facilities/tools that enable the interaction to take place (Table 1). With its many facilities, the Internet is beneficial to the students as well as the teachers.

In Malaysia, the Ministry of Education (MOE) is making its first move to introduce the Internet in schools. This is done through projects like Jaringan Pendidikan (Education Network, JP) and the Pusat Sumber Elektronik (Electronic

Resource Center, PSE) ("Access to the Internet," 1995; Ragavan, 1996; Yong, 1996a; Yong, 1996b; Zoraini, 1994; Zuhairi, 1994). As in any other innovation, this should be supported by adequate training for the teachers (Gan, 1989; Tagg, 1991). In implementing computer-related instructional activities, teachers will be able to contribute more positively in the instructional as well as administrative functions if they are better educated in the use of computers (Pina, 1992).

TABLE 1

Human-Machine Combination Options on the Internet

Communication	Internet Facilities/Tools
Person-to-person	E-mail, IRC
Person-to-many	E-mail, Listserv, newsgroup
Many people-to-many people	E-mail, Listserv, newsgroup, IRC, Moo and Muse
Person-to-computer	Telnet, FTP, Gopher, WWW
Person-to-many computers	Veronica, Gopher, WWW
Computer-to-person	Personal news services, beeper services
Computer-to-many people	Custom news services
Computer-to-computer	Content indexing, updating, and Net monitoring

From *Education on the Internet* (p. 8) by J. H. Ellsworth, 1994, Indianapolis, Indiana: Sams Publishings.

Background of the Study

In his published speech entitled *Malaysia: the way forward*, the Prime Minister of Malaysia Datuk Seri Dr. Mahathir Mohammad had pointed out the importance of IT and computer literacy in the context of national development:

In the information age that we are living in, the Malaysian society must be information-rich. It can be no accident that there is today no wealthy, developed country that is information-poor and no information-rich country that is poor and undeveloped

Computer literacy is a must if we want to progress and develop. No effort must be spared in the creation of an information-rich Malaysian society. (Mahathir, 1991, para 79-80)

Through these statements, he had clearly expressed his confidence in IT as a tool for progress and development.

Malaysia's Vision 2020 aspires to get the country towards industrialized economic status by the year 2020. To pursue this goal, massive efforts have been devoted by the Malaysian government on the computerization of the civil services. The nation's IT budget rose 23% in 1994 compared to its budget in 1993. According to the former Chief Secretary Tan Sri Ahmad Sarji Abdul Hamid, the government spent about RM 300 million on computerization projects. These projects are coordinated by the Manpower and Modernization Planning Unit (MAMPU) in the Prime Minister's Department. RM 55 million has been allocated for computerization projects in the education and social sectors ("Malaysian civil service," 1995).

Since the early eighties, the Malaysian government has been concerned with the promotion of IT literacy in the country. Such concern has been reflected in the efforts of the Ministry of Education to incorporate computers into the national school curriculum. Several projects had been initiated to examine the possibility of the integration of computers in education. These include pilot projects to introduce computer literacy as a school subject – first in 1986 (Zoraini, 1991) and later in 1992 (Ahmad, 1995; Hamzah, 1993) – and those related with the Internet. Currently, the Ministry is working on the concept of Smart Schools, where IT will be incorporated as a new and integrated component – an idea of the futuristic Malaysian school (A. Shukor, 1996; Ahmad, 1996).

In the early nineties, the Joint Advanced Research Integrated Networking (JARING) project of MIMOS had aroused the interest of educators and researchers.

It was then that the Ministry joined effort with MIMOS in a project to set up a national education network system. The project is named Jaringan Pendidikan (JP, Education Network). Its major objective is to increase communication and information exchange among teachers and students of all schools in the country. The pilot project involved 50 selected schools from all over the country (Zoraini, 1994; Zuhairi, 1994). Through JP, the Internet had entered the scene of Malaysian education.

Another project related with the Internet is the Pusat Sumber Elektronik (PSE, Electronic Resource Center) project. This project is a joint effort between the Ministry and Telekom Malaysia Berhad (TMB). Fourteen schools – one from each state – were selected to be involved in the pilot project (Yong, 1996a; Yong, 1996b). In this project, a network called Rangkaian Munsyi is set up in the 14 pilot schools, which allows students and teachers access to the Internet and other shared facilities of the network (“Electronically linked,” 1996; Yong, 1996a; Yong, 1996b).

Further to these, the Ministry is working hard to bring to realization its latest IT project – the Smart Schools. By this, it meant “...learning institutions which are equipped with new teaching-learning practices and school management to prepare children for the Information Age” (Zoraini, 1998, p.57). As a matter of fact, this is one of the strategies proposed to develop the education sector in the establishment of the Multimedia Super Corridor (Mahathir, 1998). Dwelling on the oriental Silicon Valley as the network support, Internet connection to schools will definitely be of great significance to the success of the Smart Schools project.

Researchers had revealed that Malaysian educators are generally positive towards computers and IT (Ee, 1992; Gan, 1989; Salmah, 1993; Zoraini, 1995; Zulkifli and Raja Maznah, 1994). Some teachers took initiative to attend courses

offered by private institutions at their own expense to keep up with the technology (“Teachers keep up,” 1995). The positive attitude of Malaysian teachers toward computers and IT is an encouragement to the government’s plan to introduce IT in schools. However, Tagg (1991) commented that teachers would need more than just positive attitude to successfully implement the IT incorporation plan:

The cost involved in bringing about change are higher than most realize because even when there is a willingness to change, teachers must be given time to tool themselves up to the new way of operating. Those who have been teaching successfully for years are reluctant to try something new unless they are thoroughly prepared for it, particularly when they realized that the children in their care never get a second chance. (p. 33)

Indeed, training should be among the top agenda of any IT incorporation plan in education so that teachers can be more adequately equipped. Effective in-service training programs for teachers are essential to successfully introduce the Internet into the schools.

The in-service training programs for teachers in Malaysia are characterized by the following practices (Dhamotharan, 1993):

- centrally planned, organized and implemented
- needs of the system provided for
- centrally funded
- participation is based on careful selection
- programs are basically integral parts of various curriculum projects
- utilization of key personnel strategy.

These programs cater to needs that are mainly curricular in nature, as identified by the Ministry of Education, and aimed specifically to meet national interests. The planning of the programs is often done at the national level. The initial

stages of planning are carried out without the involvement of course coordinators and organizers. The participants of these training programs are selected by selection committees in the national, state, district, and school level.

Multi-tier strategy of training is adopted. Training courses are held first at the national level for selected key personnel from all over the country. These key personnel attend training courses for a duration ranging from a few days to a few weeks. They are then expected to conduct courses for teachers at the state/district level. Very often, only a limited number of teachers get to be trained due to the insufficient expert knowledge, audio-visual aids, support services, and funds.

Failure to understand and cater to the needs of the teachers as adult learners undermines the success of in-service training programs. When the participants' needs and interests are overlooked, training programs will not be effective. Wood and Thompson (1980) pointed out some of the common problems in in-service training programs for teachers when the teachers' needs are neglected:

1. The teachers have no confidence and interest in the programs due to poor planning and organization, irrelevant activities, lack of participant (teacher and school administrator) involvement, inadequate needs assessment, and unclear objectives.
2. The negative attitude of program administrators who expect the teachers to dislike in-service training. This negative perception towards the teachers may become self-fulfilling prophecy in some cases.
3. In-service training programs tend to have district-wide focus, distant from the needs of teachers and school administrators in their own schools.
4. Programs are not personalized to be related to the teachers. The teachers have no control over their learning activities.

Several of these weaknesses mentioned by Wood and Thompson (1980) can actually be observed in the in-service practices for teachers in Malaysia.

Teachers, as adult learners, are motivated to attend in-service courses that are job-related, that offer them something that is needed for their work (Cline, Billingsley, and Farley, 1993; Robiah, 1992; Wood and Thompson, 1980). To fulfill this need, the planning of in-service training programs should be based on input from all groups concerned and the result of proper needs analysis (Robiah, 1992). A more localized training strategy should be employed. School-based approach of in-service training – where training programs are designed according to the needs of the teachers in the setting of their own schools – should be considered as an alternative.

As an example, Oxbow Creek Elementary School, Champlin – one of the selected implementation examples of the Computer Tools for Teachers project (Minnesota Department of Education, 1989) – has a school based in-service training program for teachers. Training sessions are conducted in several formats – large group, small group, or individual instruction – according to the needs and convenience of the teachers. All of these sessions are “hands-on”, or verbal synopsis followed up by “hands-on” sessions. In-service training programs on IT for teachers in Malaysia will be more effective if such school-based approach is adopted.

Purpose of the Study

As the Internet will soon be introduced in our schools, there is a need for in-service training programs on the use of the Internet for teachers. The purpose of this study is to develop and evaluate an Internet training package for teachers. The package developed and evaluated is called Basic Internet for Teachers (BasIT).

Research Questions

The process of development and evaluation of the BasIT training package is guided by the following research questions:

1. What are some characteristics of the teachers as learners?
2. According to the perception of the teachers, which among the Internet facilities available (e-mail, news-reading, EDG, FTP, Telnet, WWW, IRC, etc.) are considered relevant and appropriate for them to learn?
3. What are the computer/Internet facilities like in an average school?
4. Can the BasIT training package developed be used to conduct training for teachers in the setting of an average school?
5. Can the BasIT training package developed fulfill the training needs of the teachers on the use of Internet?
6. How can the BasIT training package be improved to provide more effective training for teachers?

Statement of the Problem

Current scenario points to the possibility of the Internet being introduced into the Malaysian classroom as a tool to enhance the instructional process. Effective in-service training programs for teachers should be planned in order to make this effort a success. In response to this need, the problem of this study is the development and evaluation of an Internet training package for teachers – the BasIT training package. The training package is developed so that it may be used in a school-based environment. This is accomplished through three major stages of instructional development (ID): needs assessment, design and development, and formative evaluation.

Rationale of the Study

At present, there are two on-going Internet-related pilot projects in the Malaysian schools – Jaringan Pendidikan (JP) and Pusat Sumber Elektronik (PSE). The Ministry of Education (MOE) had selected 50 schools from all over the country to be involved in the JP pilot project and 14 others for the PSE pilot project. To implement the project, training was conducted for the teachers involved.

For JP, 50 teachers (one from each JP school) were called for training; while for PSE, four to six teachers from each of the PSE schools were trained. For the JP teachers, the training content covered Internet skills like e-mailing, FTP, news-reading with browser, browsing the WWW, and the making of home-page; while for the PSE teachers, training activities focused on the production of schools' home-pages and the local administration skills of the Rangkaian Munsyi network. These teachers returned to their schools and are encouraged to train others to help them.

The rationale of this study is that having only a few trained teachers in a school will not be enough to successfully implement the Internet-related projects (JP or PSE) in the school. It is important to have all the teachers exposed to the use of Internet in education. By providing them with basic training of the use of Internet, the teachers will be able to contribute more positively. Knowing the capability of the Internet, they will be more comfortable with the changes that may be brought about by the implementation of these projects. They may also be willing and able to use the Internet as an instructional tool in their lessons, which will surely contribute to the success of these projects.

The teachers who have been trained at the national level are often troubled by the lack of expert knowledge, instructional media, and funds to provide training for their colleagues (Dhamotharan, 1993). Attending a training course for about a week is

hardly enough to equip them. Yet, they are suppose to conduct training for their colleagues. Even if they are thoroughly prepared to provide for the training needs of their colleagues, they will still need support in terms of training materials. After all, they may not have the time to prepare training materials due to the tight schedule of their work. The BasIT training package is developed to fulfill this need. The teachers can use the package to conduct training in their own school's setting.

The BasIT training package is developed with the Malaysian teachers as target audience and the JP/PSE teachers as the potential users. Its components include the training materials (module for participants, visual-aids, computer software, etc.); the instructor's manual; Self-Assessment Form (SAF) for the participants; and a certificate-format performance report for participants.

Studies had indicated that the Malaysian teachers are generally positive toward computers and IT (Ee, 1992; Gan, 1989; Salmah, 1993; Zulkifli and Raja Maznah; 1994). Most of them are favorable to the idea of attending computer courses. In-service training programs on the use of the Internet for teachers are almost assured of positive responses. Moreover, as JP and PSE are being introduced in schools, teachers will eventually see the need to be trained in the matter of Internet to keep up with the technology. The development of the BasIT training package which can be used in the setting of the average school is indeed timely and relevant.

Significance of the Study

The BasIT training package provides immediate training support for teachers. This training support is timely as the government has initiated the introduction of the Internet into the schools. The package is also relevant because teachers will have to be equipped with the skills of using the Internet in the near future. In several ways,

the BasIT training package developed in this study will contribute significantly to the training needs of Malaysian teachers on the use of Internet.

First, it is designed to fulfill the needs of the teachers. As recommended by Robiah (1992), proper needs analysis should be carried out before the planning and development of any in-service training program. Before producing the training materials for BasIT, formal needs assessment procedures were carried out to probe into the training needs of the teachers about the use of the Internet. Training activities were carefully selected and planned to provide teachers with activities that are relevant to their daily tasks. As adult learners, the teachers will certainly be committed to learn what they see as relevant and practical to their needs (Cline, Billingsley, and Farley, 1993; Wood and Thompson, 1980).

Second, the BasIT training package is designed for the average Malaysian school. Facilities in the schools related to the possibility of conducting Internet training were identified through needs assessment. Based on the result of the needs assessment, the training package is designed to be functional in the setting of the average school. For instance, hardware and software requirements for the BasIT training sessions had been adjusted with the facilities available in the JP/PSE schools as standard. Thus, any school which has the facilities similar to that of a JP/PSE school will be able to conduct the BasIT training sessions for its teachers.

Third, a greater number of teachers can be reached. The traditional approach of in-service training for teachers in Malaysia is the multi-tier strategy (Dhamotharan, 1993). With this approach, key personnel were selected from all over the country to be trained at the national level. These key personnel would then return to their state/district and conduct courses for their colleagues, who are selected at the state/district level. Thus, training will be available for the selected teachers or

personnel only. The number of teachers trained this way is limited. With the school-based approach adopted for the BasIT training package, the skills of using the Internet can be brought to a greater number of teachers. The knowledge and skills can be brought to the doorsteps of their respective schools. Those who are willing will have the opportunity to be trained.

Fourth, BasIT training sessions can be repeatedly conducted for anyone who need it. One of the advantages of instructional programs developed by using the formal ID process is that they are empirical and replicable. Instruction designed formally and systematically can be delivered more than once, and even on as many occasions as possible, and with as many learners as possible (Dick and Carey, 1985). Thus, the training sessions can be conducted not only once, or twice, but as many times as a school would need, to equip its teachers with the skills to use the Internet.

Fifth, the BasIT training package includes formal assessment for each participant. Formal performance assessment is often omitted from in-service training programs. Planners and administrators of the programs are reluctant to assess the participants, realizing that adult learners are negative towards such procedures, and that they consider assessment as a direct attack on their competence. Yet, the performance of each participant should be assessed, so that proper actions can be planned to improve the program or to help a particular participant. By following the formal ID procedures, assessment steps are carefully planned based on the instructional objectives set. The BasIT training package includes a set of Self-Assessment Forms (SAF) for each participant, which the participants will use to assess their own progress.

The systematically developed BasIT training package in this study will provide Internet training for teachers in their own schools' setting. It offers job-

related training activities to prepare the teachers for practical tasks in using the Internet. Any school with facilities like those of a JP/PSE school have sufficient hardware and software to conduct the BasIT training sessions. In addition, the package comes with a systematic plan of assessment. It can fulfill the needs of Internet training of teachers. Schools with sufficient hardware and software are the potential users of the BasIT training package. Thus, it is likely to become one of the tools to support the implementation of JP and PSE in the short term, and the acculturation of the Internet in Malaysian education in the future.

Assumptions and Limitations

The planning and organization of this study was based upon the assumption that the Malaysian teachers have little knowledge and experience about computers. The BasIT training package developed in this study was designed with this assumption in mind. Thus, even teachers who had never used a computer before should be able to cope with the activities in the BasIT training sessions.

Due to the limitation of time and distance, the design and development of the BasIT training package was based on the result from the needs assessment conducted on 50 JP teachers and 14 PSE teachers. The selection of instructional activities and media were restricted by the resources available to the researcher and in the schools. For instance, the researcher was only able to select instructional media that he was capable of producing and those available in the average school.

The limitation of working space in the computer rooms of the schools posed another problem. Because of this problem, the formative evaluation of the BasIT training package (the Small Group Trials) was carried out only on a selected number of teachers in one selected school, and with them sharing computers.

Since the Small Group Trials were carried out only in one school -- Sekolah Menengah (P) Sri Aman (SMSA, Sri Aman Secondary School), the Internet software used in the BasIT training package were those available in that school. For that reason, Microsoft Mail is chosen for e-mailing activities and Netscape Navigator for WWW. Although Netscape Navigator is used in almost all the JP/PSE schools, Microsoft Mail is only available in the PSE schools. Therefore, the BasIT training package produced can be fully utilized only in schools equipped with Microsoft Mail.

Operational Definition of Terms

The operational definition of the terms used in this dissertation are as follows:

Average school	School which has or is capable of acquiring the equipment that is compatible with that of a JP/PSE school, so that the BasIT training sessions can be conducted in the school.
Basic Internet for Teachers (BasIT)	The training package produced in this study. It is in Bahasa Malaysia and is named as Asas Internet untuk Guru. The components in the package include the module for participants (Modul Kursus), instructor's manual (Panduan Fasilitator), introduction pamphlet (Pengenalan Kepada Asas Internet untuk Guru), Self-Assessment Form (SAF)(Borang Penilaian Kendiri), performance report (Sijil Pencapaian), the overhead transparencies, and the computer software (Microsoft Wintutor, Powerpoint Viewer and Slides) in a floppy diskette.

Experts

Specialists in their fields of discipline. In this study, the researcher sought after experts in educational theories who are experienced Internet users. They are consulted for their expert advice on the content accuracy, instructional strategies, and presentation format of the training materials produced and provide suggestions to revise the materials.

**Self-Assessment Form
(SAF)**

The form used in the BasIT training sessions to assess the participants. It is developed according to the instructional objectives defined. The participants use it to assess their own progress. Borang Penilaian Kendiri in Bahasa Malaysia.