

CHAPTER V

SUMMARY AND CONCLUSION

In this chapter, the researcher shall first present a summarized account of the entire study. This is followed by the conclusion of the study and some recommendations for further research.

Summary

Introduction

The Malaysian government had been keen to promote information technology (IT) literacy level of its people since the early eighties. For that purpose, the Ministry of Education (MOE) had introduced several IT related projects in schools. These included pilot projects to introduce computer studies as a school subject – first in 1986 (Zoraini, 1991) and later in 1992 (Ahmad, 1995; Hamzah, 1993) – and those related with the Internet, such as Jaringan Pendidikan (JP, Education Network) and Pusat Sumber Elektronik (PSE, Electronic Resource Center). At present, the MOE is planning to introduce the concept of Smart Schools, where IT will be incorporated as an integrated component (A. Shukor, 1996; Ahmad, 1996).

The Internet has great potential as an instructional tool. However, the teachers need to be trained in order to use it effectively. Current in-service training practices in Malaysia provide training opportunities only to a selected number of teachers. The purpose of this study is to develop and evaluate an Internet training package for teachers, which is named the Basic Internet for Teachers (BasIT) training package. The whole process of the development and evaluation of the BasIT training package follows three major Instructional Development (ID) stages – needs assessment, design and development, and formative evaluation. By adopting the school-based approach, the BasIT training package can fulfill the training needs of the teachers related to the use of Internet in the setting of their own schools.

Needs Assessment

An effective in-service training program should be designed and developed to meet the needs of the participants. Robiah (1992) had proposed that proper needs analysis should be carried out before the development of training programs for teachers. Thus, the development and evaluation of the BasIT training package began with the needs assessment.

The survey instrument “Analisis Keperluan: Kursus Internet untuk Guru” (Training Needs Analysis: Internet Training for Teachers) was administered on 50 JP teachers and 14 PSE teachers in this stage of the study. Sixty-one of them responded to the survey. Based on the responses received, the researcher selected e-mailing and the World Wide Web (WWW) as the training content of the BasIT training package and decided to develop the training package in Bahasa Malaysia (Malaysian Language), the national language. Some of the findings concerning the training needs

of teachers and the resources and constraints in the schools surveyed related to the Internet were as follows:

- The computer literacy level of teachers covered a wide range – from novices to experienced computer users
- Most of the teachers were new to the Internet
- The Computer Rooms in school were relatively small and are equipped with limited number of computers and printers
- The teachers preferred to have training at their convenience
- All sorts of Internet software were being used in the schools surveyed. Netscape Navigator was the only one found to be available in almost all the schools surveyed (96.7 percent).

These findings provided ideas for the researcher in the design and development of the BasIT training package for the average school setting.

Before developing the training materials, the researcher had also visited Sekolah Menengah (P) Sri Aman (SMSA, Sri Aman Secondary School), Petaling Jaya, where the Small Group Trials were supposed to be carried out to further examine the resources and constraint of the average school related to Internet training. Based on the observations during the visit, the researcher selected the Internet software to be used in the BasIT training sessions – Microsoft Mail for e-mail and Netscape Navigator for WWW.

Design and Development

After the content of the BasIT training package was selected, the researcher analyzed the content and listed down the learning tasks and subtasks involved. This was followed by the definition of instructional objectives for each of the learning

tasks. The media and instructional activities for the training sessions were then selected. All these contributed to the production of the draft materials of the BasIT training package – training module, computer slides (Powerpoint presentation), and the Self-Assessment Form (SAF), or Borang Penilaian Kendiri.

The draft materials were reviewed by two experts, who are practicing educators and experienced Internet users. Based on the experts' comments and recommendations, the draft materials were revised before being submitted to two Small Group Trials for the purpose of formative evaluation.

Formative Evaluation

The formative evaluation of the revised materials of the BasIT training package was carried out through two Small Group Trials conducted in SMSA. The first trial was conducted with five teachers from SMSA as participants. The participants enjoyed the training sessions, recorded high scores ($M = 3.38$) in the SAF, and completed their course assignments with minimal assistance from the instructor. After the first trials, minor corrections were made and other necessary learning tasks were added to the training materials.

The new set of training materials were then used in the second trial, where 13 teachers from SMSA were involved. Like the first group, they also recorded high scores ($M = 3.28$) in the SAF and had no problem completing their assignments. At the end of the second trial, the participants were asked to fill up the questionnaire entitled Penilaian Kursus (Appendix F) to give their feedback about the BasIT training materials and activities. Their responses indicated that

- They liked and enjoyed the course
- They were clear about the course objectives

- They agreed that the course activities were suitable and can be carried in the average school setting
- They acknowledged that the training materials and activities were related to the course objectives and relevant to their work
- They were comfortable with the training materials and activities
- They considered the instructor and the visual-aids used in the course effective
- They acknowledged that the time allocated for hands-on exercises was sufficient, and that they had received clear feedback about their progress.

However, over half of the participants (58.3 percent) indicated that they need an official statement to inform them about their achievement throughout the course. This prompted the researcher to include a certificate-format performance report – Sijil Pencapaian (Certificate of Achievement) – in the first version of the BasIT training package, to be given out to the participants who have completed the course.

In addition to those stated above, the participants had also commented that the instructions given in the training materials were comprehensive, clear, and easy to follow. They found that the only weaknesses in the training sessions were the hardware/network failures, limited number of computers, and insufficient personal attention from the instructor. The participants had also provided some suggestions to improve the training package, such as

- design advanced course to follow this one
- provide quick-reference section for the hands-on instructions in the module
- reduce the size of the module, etc.

Production of the First Version of the BasIT Training Package

Based on the feedback obtained in the Small Group Trials, the existing materials of the BasIT training package were re-evaluated and revised to produce the first version of the BasIT training package. It consists of

- Modul Kursus (Course Module) – the training module
- Pengenalan Kepada Asas Internet untuk Guru (Introduction to the Basic Internet for Teachers) – introduction pamphlet for the training package
- Panduan Fasilitator (Facilitator's Guide) – instructor's manual
- Borang Penilaian Kendiri (Self-Assessment Form) – SAF
- Sijil Pencapaian (Certificate of Achievement) – certificate format performance report for participants
- Overhead transparencies
- Floppy diskette – contained supplementary software e.g. Powerpoint presentation files, Powerpoint Viewer, and Wintutor

A complete set of the first version of the package is submitted together with this dissertation.

Conclusion

The development and evaluation of the BasIT training package is guided by six major research questions:

1. What are some characteristics of teachers as learners?
2. According to the perception of the teachers, which among the Internet facilities available (e-mail, news-reading, Electronic Discussion Group, File Transfer Protocol, Telnet, World Wide Web, Internet Relay Chat, 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 teachers on the use of the Internet?
6. How can the BasIT training package be improved to provide more effective training for teachers?

In the following sections, the researcher shall discuss the answers obtained in the course of this study for these research questions.

Research Question One

Question: What are some characteristics of teachers as learners?

To deal with this question about the learner characteristics of teachers, the researcher reviewed literature concerning adult learning and staff development. The study of related works (Bennett, 1994; Cline, Billingsley, and Farley, 1993; Joyce and Showers, 1980; Wood and Thompson, 1980) revealed several characteristics of adult learners, such as

- Adult learners commit to learning when the goals and objectives of the training programs are considered realistic and important to them; and when they find the activities relevant to their personal and professional needs
- Adult learners need to see the results of their effort and have accurate feedback about their progress; yet on the other hand, they are always anxious in new learning situations and are fearful of external judgment on their competence
- Adult learners want to be involved in the planning and control of their own learning. They are self-motivated and one can only encourage and create

conditions which will nurture what already exists in them. They learn best through concrete experiences in which they apply what is being learned.

- Adult learning is enhanced by planner and trainer behaviors that demonstrate respect, trust, and concern for the learner. They learn best in informal situation where social interactions take place.

Effective in-service training on IT for teachers can be developed based on the knowledge of the teachers as adult learners. Some other points to be considered also are

1. The instructor for such training programs should be a trained teacher who is also competent in the matter of IT (Bennett, 1994; Robiah, 1992)
2. The content of the program should have clear goals and objectives, relevant to the teachers' needs (Bennett, 1994; Oh, 1992). It should also adopt a basic and non-technical approach since adult learners are motivated by results (Gan, 1991).
3. The training activities in such programs should combine several training elements – presentation, modeling, practice, coaching, and others (Joyce and Showers, 1980).
4. Hands-on practice is vital in computer-related training (Martin, 1990), and this should be supported by sufficient hardware and software, properly designed instructional manuals, and ergonomically designed computer training room (Oh, 1992).
5. The training programs should be organized over a period of time and at the convenience of teachers (Bennett, 1994; Ee, 1992; Minnesota Department of Education, 1989).
6. The assessment of the participants should be planned so that it can cover both the theoretical and practical aspects of the subject (Noordin, 1991). Furthermore,

planners should bear in mind that the adult learners will resist any learning situations which they perceive as attacks on their competence.

These findings from the review of literature provided the researcher with some ideas about adult learning and the planning of an effective in-service training program on IT for teachers.

Research Question Two

Question: According to the perception of the teachers, which among the Internet facilities available (e-mail, news-reading, Electronic Discussion Group, File Transfer Protocol, Telnet, World Wide Web, Internet Relay Chat, etc.) are relevant and appropriate for them to learn?

Based on the responses to the survey instrument “Analisis Keperluan: Kursus Internet untuk Guru” (Training Needs Analysis: Internet Training for Teachers), the researcher discovered that the computer experience of teachers in schools varies – from novices to experienced users. It was also found that most of them were new to the Internet.

When asked about their training needs related to the Internet, three of the Internet skills were indicated – e-mailing, news-reading, and the World Wide Web (WWW). Almost all the respondents acknowledged that these three skills are relevant to the daily work of the teachers and appropriate to their computer experience.

Following these findings, the researcher consulted the experts and reviewed Internet-related survey reports to make decisions about the training content of the BasIT training package. Eventually, e-mail and WWW were selected due to the fact that

- they are most frequently used among Internet users

- they cover two important functions of the Internet – communication and information retrieval
- user-friendly Windows-based software for e-mail and WWW are widely available.

Research Question Three

Question: What are the computer/Internet facilities like in an average school?

The responses to the survey instrument provide answer to the researcher concerning the computer/Internet facilities of the average school. The responses received revealed that

- the schools have limited number of computers and printers, and
- the Computer Rooms in schools are relatively small, most of which can accommodate only 10 to 20 persons at most for training activities at any one time.

Therefore, the training activities for the BasIT training package were carefully selected to cater for training in small groups of less than 20 persons at a single occasion.

Research Question Four

Question: Can the BasIT training package developed be used to conduct training for teachers in the setting of an average school?

The positive attitude of the participants in the Small Group Trials confirmed that the BasIT training package developed can be used to conduct Internet training for teachers in the setting of an average school. In their feedback to Penilaian Kursus, all the participants of the second Small Group Trial agreed that the training activities in the package are suitable and can be carried out in school. However, due to the fact

that Microsoft Mail and Netscape Navigator were chosen as the software used in the package, only the schools equipped with these software can fully utilize the package.

Research Question Five

Question: Can the BasIT training package developed fulfill the training needs of the teachers on the use of Internet?

According to Chinien and Boutin (1994), the instructional effectiveness of training materials is indicated by elements such as learner's attitude and achievement. In the Small Group Trials, the researcher observed that the teachers were comfortable during the BasIT training sessions and enjoyed the training activities. Positive comments were given when asked about the training course. Furthermore, the participants' feedback to the "Penilaian Kursus" (Course Evaluation) questionnaire had also indicated that they enjoyed the training sessions. The positive attitudes of the participants is an indication that the BasIT training package is effective in providing for teachers' training needs related to the use of Internet.

Another indication of the effectiveness of the BasIT training package is the achievement of the participants. The participants recorded average score 3.38 in the SAF for the first Small Group Trial and 3.28 for the second trial over the total score of 4. All participants completed and submitted their assignments.

Based on the positive attitude and excellent achievement of the participants in the Small Group Trial, the researcher concluded that the BasIT training package is effective in fulfilling the training needs of the teachers on the use of Internet.

Research Question Six

Question: How can the BasIT training package be improved to provide more effective training for teachers?

This question guided the researcher along in the evaluation and revision of the materials. The BasIT training package had been evaluated and revised several times since it was first developed as the draft materials. It was reviewed by experts before being revised to be used in the Small Group Trials. The experts provided ideas for accurate content, format of presentation, and instructional sequence. After the first Small Group Trial, minor correction had been made to the module and more activities were added in. The participants' feedback in the "Penilaian Kursus" (Course Evaluation) questionnaire after the second Small Group Trial provided some other ideas to further improve the BasIT training package. These include

- Design advanced course to follow this one
- Reduce the size of the module
- Provide quick-reference of hands-on instruction.

All these led to the production of the first version of the BasIT training package, which consists of

- Modul Kursus (Course Module) – the training module
- Pengenalan Kepada Asas Internet Kepada Guru (Introduction to Basic Internet for Teachers) – introduction pamphlet to the BasIT training package, included after the Small Group Trials
- Panduan Fasilitator (Facilitator's Guide) – instructor's manual, included after the Small Group Trials
- Borang Penilaian Kendiri (Self-Assessment Form) – SAF
- Sijil Pencapaian (Certificate of Achievement) – certificate-format performance report for participant, included after the Small Group Trials
- Overhead Transparencies – included after the Small Group Trials

- Floppy Diskette – contained supplementary software e.g. Microsoft Powerpoint presentation files, Powerpoint Viewer, Wintutor, etc., included after the Small Group Trials.

In conclusion, the BasIT training package (or any other training package) can be improved by continuous evaluation and revision, with the training needs of the teachers taken into consideration. Some practical steps on how the package can be further improved are discussed in the following section under the heading “Discussion and Recommendations”.

Discussion and Recommendations

In this last section, the researcher shall first discuss some special aspects of this study. These are additional explanation and description of certain steps taken in the course of the study. This shall then be followed by the recommendations to further improve the BasIT training package. Some of the recommendations made by the participants in the Small Group Trials are also covered.

Discussion

The development and evaluation of the BasIT training package is accomplished through three ID stages – needs assessments, design and development, and formative evaluation. The output of one stage is the input for the next. In the needs assessment stage, the responses of 61 JP/PSE teachers were analyzed to examine the training needs of the teachers and also the resources and constraints of the schools with respect to the Internet.

The survey instrument “Analisis Keperluan: Kursus Internet untuk Guru” (Training Needs Analysis: Internet Training for Teachers) (Appendix A) was sent to

50 JP teachers and 14 PSE teachers all over the country. The researcher checked mail every two weeks after the first mailing. Additional mailing had been done for the subjects whose responses have yet to be received. Although the researcher had eventually received 61 responses, it was nonetheless a long and trying wait. Therefore, those who intend to collect data through mail surveys should be prepared for some careful planning and a long wait! Perhaps telephone interview is a better alternative.

In the formative evaluation stage, the one-to-one trials were replaced by the first Small Group Trial to save time and resources. This is acceptable since the BasIT training package is actually designed and developed to be used for small group training situations. However, the first Small Group Trial was still meant to serve the purpose of the one-to-one trial – to identify obvious errors in the instructional materials and to obtain initial reaction from the target learners (Dick and Carey, 1985). In this study, the researcher had made good use of the first Small Group Trial to identify errors in the training materials.

After the first Small Group Trial, minor errors in the materials were identified – spelling mistakes, ambiguous statements, erroneous Uniform Resource Locators (URL), etc. These are immediately corrected on the pages with pencil once identified. It was also during this trial that the researcher realized the need to include two related activities in the hands-on exercises – deleting mail from the Microsoft Mail's Deleted Mail folder and removing Bookmarks from Netscape Navigator's Bookmark list.

Network failure had been a major problem during the Small Group Trials. During the period when the second Small Group Trial was conducted, the training sessions had to be postponed indefinitely due to frequent network failures. The participants were so disturbed that they put network failure down as the main

weakness of the training course in the questionnaire *Penilaian Kursus* (Course Evaluation) – which was administered after all the training sessions – although hardware problems were actually irrelevant as far as the evaluation of the BasIT training package is concerned. However, the problem of hardware/network failure was real and it affected the training sessions and brought disappointment to the teachers. For successful implementation of Internet-related projects in schools, the bodies concerned – Bahagian Teknologi Pendidikan (BTP, Educational Technology Division), Telekom Malaysia Berhad (TMB), Malaysian Institute of Microelectronic System (MIMOS), Ministry of Education (MOE) – will have to take positive actions to prevent or control these frequent and unpredictable network failures in the schools.

Recommendations

The participants of the Small Group Trials had made several suggestions to further improve the BasIT training package. First among these is the suggestion to develop an advanced training course to follow this one. Due to the fact that the BasIT training package has yet to be implemented, this recommendation would have to be kept in view. Nevertheless, the idea of the Advanced Internet for Teachers training package is definitely worth considering since successful implementation of Internet connection at schools depends also on ongoing training for the teachers (Gallo and Horton, 1994).

The recommendation to include quick-reference for hands-on instructions has been adopted to produce the first version of the BasIT training package. A quick-reference section of hands-on instructions for each BasIT training sessions is included after its complete instructions in the training module of the first version. The

researcher had also taken note of the idea to have the training module published in smaller size.

According to ID researchers, the final stage of the formative evaluation is the field trial (Dick and Carey, 1985; Leshin, Pollock, and Reigeluth, 1992). Although the second Small Group Trial can be considered as a field trial, the effectiveness of the BasIT training package can be further improved if it is put through more trials. Thus, the first version of the BasIT training package produced in this study should be put through trials in more schools, involving more teachers all over the country. As suggested by ID researchers like Kemp (1985) and Thiagarajan (1990), formative evaluation should be a continuous process to improve a training package.

Some participants in the Small Group Trials complained that there was insufficient personal attention from the instructor. This reflects the need of an assistant for the instructor if the number of participants is too big to handle. Training courses for instructors (and their assistants) of the BasIT training package should be designed and developed to uphold the quality of the training provided by the training package. License for qualified instructor of the BasIT training sessions should be issued for those who are trained only. This is important because the teachers, as adult learners, prefer credible trainers who are also trained teachers themselves (Bennett, 1994; Noordin, 1991; Rokiah, 1992). Perhaps training for the instructor can be included in the purchasing deal of the BasIT training package.

The BasIT training package focused on the use of the Microsoft Mail for e-mail and Netscape Navigator for WWW. This software-based approach is adopted on the basis of the suggestion of researchers to avoid being too technical in IT training for teachers (Gan, 1991; Noordin, 1991; Oh, 1992). The problem of being software-based is that it is highly procedural. The teachers will only be trained to use the

software covered in the training package. Netscape Navigator is so far the most popular Web browser around, so there shall be less problems in transferring the Web-browsing skills. But the findings of the needs assessment in this study revealed that there are many kinds of e-mail software used in the schools surveyed, such as Pine, Eudora, Pegasus, etc. For the benefit of more schools, the training materials for the e-mail sessions should be developed to cover the related skills in general, featuring examples of the application of the various kinds of e-mail software used in the schools. By so doing, the teachers would be able to transfer the skills learned more easily than if they are trained to use one software only.

The proposal of the Multimedia Super Corridor in Kuala Lumpur had also set the path for Malaysia towards a new era of global information exchange. In the midst of the industrialization chase, multimedia emerged as a powerful tool. Computer-Based Training (CBT) programs which make use of multimedia to disseminate information and conduct training had been used in factories, offices, government agencies, corporate firms, and other institutions in the developed countries. These programs provide self-controlled learning features and are effective for adult training. For instance, in Singapore, CBT programs had been used in the hospitals to train their employees, including non-clinical staff (Kashinath, 1995). Surely the same technology can be employed in Malaysia.

The teachers, as adult learners, want to be involved in the planning and control of their own learning (Cline, Billingsley, and Farley, 1993; Wood and Thompson, 1980). They also prefer to have training programs at their convenience (Ee, 1992; Minnesota Department of Education, 1989). The CBT programs – which introduce self-paced, individualized learning suitable for effective adult training – will be able to provide the suitable training environment for them. Thus, a CBT version of the

BasIT training package should be developed in the future. With the CBT version, the teachers can choose to follow any BasIT training session they want at their convenient, and have control over their own learning. The CBT version of the BasIT training package will also greatly increase the number of teachers reached since it can be circulated better in the form of compact disks (CD) and floppy diskettes, with the necessary software – including the e-mail software, the Web browsers, and others – included in the package.

The BasIT training package is developed with the teachers in mind. To insure that the teachers received full benefit of the training package, related bodies and institutions should play their parts in introducing it to the schools. In the government, the MOE should spearhead the efforts to make full use of the BasIT training package for the benefit of the teachers. The Teachers Training Divisions can introduce it to the Teachers Training Colleges. Institutions of higher learning can conduct research and development project related to Internet training for teachers, or by simply testing the training package on their teaching staff or students. Internet service providers – like MIMOS and TMB – can assist to set up Internet connections in more schools, charging special rates, if not free-of-charge. Non-government organizations like the Malaysian Council for Computers-in-Education (MCCE) may want to help promote the use of the BasIT training package among teachers. Through the joint efforts of all these bodies/ institutions, the BasIT training package can be successfully introduced to be used in the schools to fulfill the pressing needs of our teachers for Internet training.