CHAPTER III

METHODOLOGY

In this chapter, the researcher shall describe the methodology used in this study to develop and evaluate The Basic Internet for Teachers (BasIT) training package. First, an overview of the methodology will be presented. This will then be followed by the description of each step of the procedures and the instruments used in detail.

Overview of the Methodology

The application of Instructional Development (ID) principles is recommended by researchers in developing effective in-service training programs for teachers. Systematic process of designing and developing training materials for teachers will certainly be able to help fulfill their training needs.

Based on the study of various ID models, the researcher constructed a nine-step model to be used in the development and evaluation of the BasIT training package in this study. The nine steps of action were carried out in three ID stages – needs assessment, design and development, and formative evaluation. Table 4 summarized the model by briefly describing the purpose, the ID activities involved, instruments used, and the expected result at the end of each of the steps.

TABLE 4

The ID Model used in the Development and Evaluation of the BasIT Training Package

Stage	Step	Purpose	Activities	Instrument(s)	Results
Needs Assessment	1. Needs Assessment	• Make inquiries about the training needs of teachers related to Internet. • Identify the resources and constraints of the schools, in general, related to Internet training.	• Prepare survey instrument. • Send survey instrument to 50 Jaringan Pendidikan (JP) teachers and 14 Pusat Sumber Elektronik (PSE) teachers. • Analyze responses and consult experts. • Select content for BasIT based on responses.	Survey instrument -- Analisis Keperluan: Kursus Internet Untuk Guru-Guru (Internet Training for Teachers: A Needs Analysis), see Appendix A.	• Feedback from the teachers. • A list of contents for the BasIT training package.
Design and Development	2. Task Analysis	Identify learning tasks related to the training desired and break them into manageable steps.	• Identify major learning tasks. • Write subtasks for major tasks. • Arrange the tasks and subtasks in instructional sequence (construct flow-chart).	Form -- Task Analysis (Appendix B).	• A list of learning tasks with the related subtasks. • Flow-chart showing the sequence of tasks and subtasks.

TABLE 4 (continued)

The ID Model used in the Development and Evaluation of the BasIT Training Package

Stage	Step	Purpose	Activities	Instrument(s)	Results
Design and Development (continued)	3. Definition of Instructional Objectives	Write instructional objectives for each learning tasks and subtasks.	• Write, analyze, and evaluate instructional objectives for each task. • Categorize the objectives -- whether they are terminal, intermediate, or enabling objectives. • Match the objectives with related tasks. • Develop assessment instrument -- Borang Penilaian Kendiri (Self-Assessment Form, SAF).	• Form -- Analysis of Instructional Objectives (Appendix C). • Form -- Learning Tasks and Their Objectives (Appendix D).	• A list of instructional objectives corresponding to the learning tasks. • Borang Penilaian Kendiri (Self-Assessment Form, SAF) according to the standards set in the objectives.
	4. Selection of Media and Instructional Activities	Select appropriate media and instructional activities.	• Break the contents down to be presented over a few sessions. • Select media and activities for each session.	Form -- Selection of Media and Instructional Activities (Appendix E).	A list of media and instructional activities for each BasIT training session.

TABLE 4 (continued)

The ID Model used in the Development and Evaluation of the BasIT Training Package

Stage	Step	Purpose	Activities	Instrument(s)	Results
Design and Development (continued)	5. Preparation of Draft Materials	Develop a set of draft materials.	• Prepare draft materials. • Identify experts. • Develop Penilaian Kursus questionnaire to be used in Small Group Trials.		• Draft copies of module, visual-aids (computer slides), and SAF for each BasIT training session.. • A list of experts to consult. • Questionnaire -- Penilaian Kursus (Appendix F) to collect feedback after second Small Group Trial.
Formative Evaluation	6. Expert Review	Consult experts and get their advice and recommendations for the revision of the draft materials.	Distribute copies of the draft materials to the experts and get their feedback.		Suggestions and recommendations of the experts for the revision of the draft materials.
	7. Revision of Draft Materials	Revise the draft materials based on the experts' recommendations.	• Analyze the feedback from the experts. • Revise the draft materials.		A set of revised materials.

TABLE 4 (continued)

The ID Model used in the Development and Evaluation of the BasIT Training Package

Stage	Step	Purpose	Activities	Instrument(s)	Results
Formative Evaluation (continued)	8. Small Group Trials	• Identify obvious errors in the training materials and obtain initial reactions to the contents from learners. • Try out the materials on small groups of target learners to obtain their feedback. • Get ideas to improve the BasIT training package.	**First Trial** • Select five teachers from Sekolah Menengah (P) Sri Aman (SMSA), Petaling Jaya as participants. • Go through the lessons, including performance assessment using the SAF, with the participants. • Take note of errors and areas to be improved. • Make corrections and adjustments to materials. **Second Trial** • Select 13 teachers from SMSA, Petaling Jaya as participants. • Conduct BasIT training sessions for the second small group.	Questionnaire – Penilaian Kursus (Appendix F).	• Get participants' feedback using questionnaire – Penilaian Kursus. • Other feedback obtained through informal interviews/conversation with participants.

TABLE 4 (continued)

The ID Model used in the Development and Evaluation of BasIT Training Package

Stage	Step	Purpose	Activities	Instrument(s)	Results
Formative Evaluation (continued)	8. Small Group Trials (continued)		**Second Trial** (continued) • Collect feedback from the participants after the trial sessions.		
	9. Production of the first version of the BasIT Training Package	Prepare the first version of the BasIT training package.	• Analyze the feedback from the participants in the Small Group Trials. • Re-evaluate contents, instructional objectives, media, and activities as a whole. • Revise the materials. • Develop the first version of the BasIT training package.		The first version of the BasIT training package.

In the following section, the researcher shall describe each of the ID steps in detail.

Step One: Needs Assessment

The needs assessment was carried out through a self-administered survey instrument. The instrument was sent to the respondents (electronically or by post). The researcher had chosen mail survey to do this for the following reasons:

1. The subjects selected are distributed all over the country. By using mail survey, their responses can be gathered at the same time through the mail.
2. Respondents may answer at their convenience.
3. Interviewer biases can be avoided since this involved no interviewers.

The procedures in the process of needs assessment are described in the following section.

Development and Validation of the Survey Instrument

The needs assessment process began with the development of the survey instrument – Analisis Keperluan: Kursus Internet Untuk Guru-guru (Training Needs Analysis: Internet Training for Teachers) (Appendix A). The survey instrument was prepared by the researcher. Initially, the instrument contained only two parts – one to inquire about the teachers and computer/Internet facilities in the respondent's school and another to probe into the training needs and preferences of the teachers about the use of the Internet. Later, realizing that the teachers might have a preference of time for training, another part was added to the instrument for that purpose.

The instrument was reviewed by the research supervisor of the researcher. Based on her feedback and advice, it was revised several times. From the first draft of

the instrument to its final version, several of its features were revised and improved, such as

- items were corrected for simplicity and clarity. For instance, the introduction of the instrument was simplified, the spelling and usage of certain words/terms were verified, etc.
- the number of pages reduced. The number of words have been reduced after it was simplified, hence the number of pages. The number of pages was further reduced when the researcher chose to use a smaller font.
- the format of presentation improved. By the using of tables, several items – items nine and 10 – were made more presentable and easy to follow.

The instrument produced was then tested on two teachers from Sekolah Menengah Bukit Bandaraya, Kuala Lumpur. This school is involved in the Jaringan Pendidikan (JP) pilot project. The teachers were selected as subjects because they are teacher advisors to the school's Computer Club, and were directly involved in the implementation of JP. Some minor correction were made based on their feedback and the final version of the instrument – as attached in Appendix A – was produced.

Subjects

A sample of subjects was selected from the target group – the teachers – to give their responses. Fifty JP teachers and 14 PSE teachers were selected. They are selected based on the following reasons:

- They had been exposed to the Internet and its facilities through the training they received at the national level. Therefore, they are more likely to be able to provide useful information as to the needs and priorities of teachers related to the Internet.

- Since they are serving in the schools, they would be familiar with the resources and constraints that the schools have as far as the Internet is concerned.
- As practicing teachers, they would be able to suggest relevant contents that should be included in the BasIT training package – contents that are able to fulfill their professional needs, and also compatible with the ability level of teachers in general.

Sixty-one out of the 64 subjects responded to the survey.

Administration of the Survey Instrument

A list of address of the JP teachers was found on the web pages developed by the Computer Technology Laboratory (Makmal Teknologi Komputer, MTK) of the Malaysian Institute of Microelectronic System (MIMOS); whereas the addresses of the PSE teachers were acquired from the Bahagian Teknologi Pendidikan (Educational Technology Division, BTP) of the Ministry of Education (MOE). Since the e-mail addresses of some were available (mostly attached to their school's server), the researcher contacted them through e-mail to get their responses. At the same time, the survey instrument was sent by mail to the others.

According to Shaughnessy and Zechmeister (1990), follow-up mailing should be sent to increase response rate since the first mailing is likely to have been lost. Thus, the researcher sent three mailing, spaced two weeks apart, assuming that the each mailing takes about a week to reach and a week to be returned. Follow-up telephone calls were also made in order to make sure whether the respondents had received their mailing packages.

Each mailing package contained the following items:

1. A cover letter stating the background, purpose, and other directions concerning the survey;

2. The copy of the approval letter for this study from the Educational Planning and Research Division (EPRD) of the MOE;
3. The survey instrument (Appendix A);
4. A stamped and addressed return envelope;
5. A copy of the cover of the booklet *The Educator's Online Resource Guide* to be sent to the respondent upon receiving his/her response. This was included in the mailing package to encourage the subject to take prompt action in giving his/her response.

Selection of Training Content

The teachers' responses were analyzed and used to select a list of content for the BasIT training package. The list of content thus selected was then brought before the experts for their comments and recommendation.

The Survey Instrument

The instrument Analisis Keperluan: Kursus Internet Untuk Guru-guru (Training Needs Analysis: Internet Training for Teachers) (Appendix A) was used in the needs assessment. Meant to be self-administered through mail survey, the instrument was designed according to the suggestions of Shaughnessy and Zechmeister (1990). According to them, return rate will be highest when

- the instrument requires a minimum effort from the respondent,
- the topic of the survey is of intrinsic interest to the respondent, and
- the respondent identifies in some way with the organization or researcher sponsoring the survey.

To minimize the effort on the part of the respondents, the items were made as concise as possible. Most of the items only require the respondent to provide brief numerical answers, or to tick his/her choices. There were a few items accompanied with open-ended options to allow elaboration where necessary (items 3.4, 4.2, five, eight, nine, 10, 11, and 12) and only one open-ended item (item six). According to the recommendation of the research supervisor of the researcher, the texts of the instrument were carefully formatted such that the number of pages was minimized. Apart from that, the pages and the items were numbered so that the respondent can easily follow the sequence of the items.

Since the selected subjects were teachers themselves, the survey topic – Internet Training for Teachers – would be of their interest. Furthermore, as JP/PSE teachers, they were involved in projects that are directly related to the use of the Internet. These assured the researcher of a high return rate to the mail survey.

The instrument was developed in Bahasa Malaysia (Malaysian Language), the national language. The teachers in Malaysian government schools should have no problem understanding the language. As a matter of fact, the instrument was sent together with a cover letter and the approval letter from MOE's EPRD for this study, both also in Bahasa Malaysia.

The purpose of the needs assessment was to gather information concerning the training needs of teachers related to the Internet. Apart from that, information about the facilities in the schools related to Internet training was also to be gathered. To achieve these goals, the instrument was divided into three parts – information about the teachers and the computer/Internet facilities available in the respondent's school; information about the training needs and preferences of the teachers related to the Internet; and the teachers' preferences of time for training sessions.

The first part of the instrument contained items inquiring about the teachers in the respondent's school. Items one and two were designed to obtain a general idea about teachers' experience with the computer and the Internet. This information was needed to help the researcher understand the teachers better so that the materials developed will meet their level of experience and ability.

Item three covered information about hardware and software available in the computer room of the respondent's school – the number of computers, the number of Internet-ready computers, whether the computers were installed with Windows and mouse, Internet software available, and the number of printers. This was to provide the researcher with some ideas about the facilities of the average schools related to the use of Internet. The design and development of the BasIT training package was carried out with these in consideration.

Item four extracts information about the physical condition of the computer room – whether it is air-conditioned, training facilities available, and the maximum number of learners it can accommodate comfortably at a single occasion. The information obtained with this item was meant to provide practical guidance for the researcher in the aspect of space and level of comfort, which is one of the practical factors to be considered in the selection of media according to Gagne and Briggs (1979). The matter of space affects the number of learners acceptable at any single occasion and the choice of media for the training sessions. Bigger space and higher level of comfort allow more learners to participate and provide more room to make use of certain instructional media – like the overhead projector – and instructional activities such as role-play, simulation, demonstration, etc.

The second part of the instrument was designed to probe into the training needs of the teachers related to the Internet. Items five and six serve to get the

respondent's opinion about the need of Internet training for teachers. Item five required the respondent to indicate how necessary the training is – no need, possibly need, need, or definitely need – according to him/her. The respondent was required to give reason(s) for his/her choice. Item six was an open-ended item where the respondent was asked to comment on a given statement. The statement translated:

> Every teacher in a school should receive Internet training in order to successfully organize Internet activities for the students in that school.

By the response received, the researcher understood better the teachers' attitude towards having Internet training, and also whether they think having one trained teacher in each school is enough to implement Internet-related project successfully in the school. The response to these items (five and six) were indications of the teachers' opinion about whether there is a need for training on the Internet for teachers.

Item seven concerns the language to be used in the BasIT training sessions. There was a need to find out whether the teachers would prefer to have the training in English or Bahasa Malaysia, the national language. This item was designed to help the researcher decide whether to produce the BasIT training package in English or in Bahasa Malaysia.

The subjects were JP/PSE teachers who had been exposed to training on the Internet. Before getting them to suggest possible content/activity for the BasIT training sessions, the researcher need to know about their experience with the Internet. Item eight required them to tick (√) those Internet activities he/she had gone through before among a list of activities – e-mailing, news-reading with browser, subscribing to electronic discussion groups (EDG), forming an electronic discussion group, Gopher, File Transfer Protocol (FTP), Telnet, exploring the World Wide Web

(WWW) with browser, and developing home-page. The respondent was asked also to name other activities besides those listed. This list of activities was constructed by the information gathered from the review of literature on teachers' use of Internet, the study of JP project and its objectives, and the training materials used in the training courses for JP teachers by Makmal Teknologi Komputer (Computer Technology Laboratory, MTK) of MIMOS.

Item nine required the respondent to rate the importance of each skill in the list of Internet activities in item eight. The respondent was to consider the skills listed and indicate their importance – not important, may be important, no idea, important, or very important – in the daily work of teachers. The item was designed in Likert-scaled format, with the scores recorded above each column and the interpretation of the scores right on top of the scores (1 = not important, 2 = may be important, 3 = no idea, 4 = important, and 5 = very important). The responses to this item helped the researcher understand the training needs of the teachers and thus select relevant content for the BasIT training package. In addition to the indication of scores, the respondent was allowed to elaborate on his/her choice(s).

In item 10, the respondent indicated how appropriate the activities (as listed in item eight) are, related to the level of computer knowledge and experience of the teachers. Likert-scale of five scores (1 = too difficult, 2 = difficult, 3 = no idea, 4 = ppropriate, 5 = most appropriate) was used for this item. The respondent was to indicate whether the activities were too difficult, difficult, appropriate, or most appropriate for the teachers' level of computer-related skills. If he/she has no idea whether a certain skill was too hard or just nice, he/she can make that indication too (3 = no idea). Like item nine, the respondent can also elaborate on his/her responses. The responses to this item serve to provide some ideas about the ability level of

teachers in learning about and using the computer. Together with the responses for items one and two, the researcher can make decisions on which among the listed skills should be included in the BasIT training package – which is appropriate to the teachers' pre-requisite knowledge and skill.

The third part of the instrument was concerned with the teachers' preferences of time for the BasIT training sessions. Studies had revealed that teachers prefer in-service courses on computers to be conducted at a convenient time (Minnesota Department of Education, 1989). For example, in the study of Ee (1992), many of the lecturers in a Malaysian Teachers Training College expressed that they prefer to attend computer course conducted in the afternoon – that is during their free hours, while some of them prefer to have the courses during weekends and semester breaks. Based on these findings, item 11 allows the respondent to express his/her preference of training time – after school on school days, during weekends, during term breaks, or others. This is supported by item 12 which requires the respondent to indicate how long, in his/her opinion, should a training session last. These items (11 and 12) serve to provide information of the teachers' preferences about the time to conduct courses and duration of each training session. This helps the researcher to make adjustments to instructional activities so that the training sessions can be conducted within a acceptable duration, and to insure that each training session is not too long.

At the end of the instrument, the researcher requested the respondent to fill in his/her contact address, telephone number, and e-mail address (if any). This was requested at the end of the instrument so that the sense of anonymity remained when the respondent filled up the instrument. As long as he/she consider himself/herself anonymous, the information given will be more truthful and genuine. Care was taken to inform the respondent that the contact particulars were needed so that the researcher

can contact him/her for clarification when necessary. This was to further assure the respondent that it was not for incriminating reasons that these particulars were required.

Step Two: Task Analysis

The task analysis process began with the study of the list of content selected based on the information gathered in the needs assessment stage. The learning tasks involved in the content listed were identified and recorded in the form entitled Task Analysis (Appendix B). The subtasks for each of the learning tasks were identified and recorded accordingly. After the learning tasks have been analyzed, a flow-chart displaying the relationship of the tasks and subtasks was constructed as Ganske and Hamamoto (1984) did. The flow-chart was used as a guide for the definition of instructional objectives, media selection, and the planning of instructional activities.

Instrument

The instrument used in task analysis was the form entitled Task Analysis (Appendix B). It was designed by the researcher to record learning tasks and subtasks involved for a particular training content/topic.

The content/topic to be analyzed was recorded on top of the table in the form. Major learning tasks involved were recorded on the left column of the table under the heading "Learning Tasks". On the right column of the table, under the heading "Subtasks", the subtasks to be accomplished in order to fulfill each major task were recorded, corresponding to the respective major tasks. These subtasks were further classified as transfer tasks and procedural tasks.

Step Three: Definition of Instructional Objectives

Refering to the learning tasks and subtasks recorded in the Task Analysis form, objectives for each of the task were then written. This was carried out by using the forms entitled Learning Tasks and Their Objectives (Appendix D) and Analysis of Instructional Objectives (Appendix C).

Learning Tasks and Their Objectives was used to record the instructional objectives for each learning tasks and subtasks. These objectives were categorized into three groups – terminal objectives (TO), intermediate objectives (IO), and enabling objectives (EO) – depending on the nature (procedural or transfer) and the level of difficulty of the task or subtask in question. The flow-chart constructed during the task analysis stage was used as a guide to classify the objectives.

Analysis of Instructional Objectives was used to evaluate the objectives written. Before an objective was accepted and entered into Learning Tasks and Their Objectives, it was first analyzed and evaluated by using Analysis of Instructional Objectives. This was to insure that each objective written contains the three essential components – condition, performance, and standard – as outlined by many ID experts, including Dick and Carey (1985).

Instrument

Both the forms used in this step were designed by the researcher. The form entitled Learning Tasks and Their Objectives contained a table with three columns. Its middle column was used to record learning tasks and subtasks, with the heading "Tasks/Subtasks".

Its most-right column was used to record the objectives for the respective tasks and subtasks. Under the heading "Objectives", this column was further divided into

three columns for the entries of terminal objectives (TO), intermediate objectives (IO), and enabling objectives (EO) respectively. On the far left, the column with the heading "Objective No." was used to record the reference number of the objectives written – such as TO1 for terminal objective No. 1; IO1.2 for intermediate objective No.2 for TO1; EO1.2.2 for enabling objective No. 2 for IO2 for TO1; and so on.

Analysis of Instructional Objectives was made up of three columns under the headings "Condition", "Performance", and "Standard". The extra column on the far left was used to record the reference number of the objectives being analyzed and evaluated.

Step Four: Selection of Media and Instructional Activities

Based on the information gathered during the needs assessment and the result of the task analysis, the researcher proceed to select appropriate media and instructional activities for the BasIT training package. For this purpose, the researcher used the form entitled Selection of Media and Instructional Activities (Appendix E). This form was designed by the researcher based the theory of instructional events suggested by Gagne and Briggs (1979).

First, the researcher broke the list of content for the BasIT training package down to be delivered in a few training session. To do this, attention is given to several factors, including:

- The instructional sequence of the contents. Learners learn better if the content is arranged from simple to complex, from concrete to abstract. Thus, the content of the BasIT training sessions was arranged from the basics to the advanced, maintaining the continuity in learning. The flow-chart constructed based on the task analysis served as reference in this matter.

- Amount of content in each session. Excessive amount of content or information should be avoided for one single instructional session. The teachers, as adult learner, need time to practice and experiment with their newly acquired skills (Bennett, 1994).
- Duration for each session. The duration of each session should not be too long. Therefore, if the content to be delivered in a session required too much time, the session will be split up to be delivered in two separate sessions.

With the content broken down, each session was then analyzed by using the form entitled Selection of Media and Instructional Activities (Appendix E). For each of the instructional event in each session, the duration, stimulus, media, rationale for media selection, instructor's activity, and learner's activity were recorded in this form.

By following the above procedures, the researcher made decisions about the media and instructional activities to be adopted in the BasIT training sessions. Based on these decisions, a set of draft materials of the BasIT training package was prepared.

Instrument

Selection of Media and Instructional Activities (Appendix E) is a table to record selection of media and instructional activities for the instructional events involved in a training session. It is used to analyzed the BasIT training sessions to identify suitable media and instructional activities. On top of the table, the terminal objectives of the session to be analyzed were recorded. Then, each instructional event in the session was carefully analyzed.

The table in this form consists of six columns. On the far left, the column with the heading "Instructional Events" records the nine events of instruction according to Gagne (Gagne and Briggs, 1979). These events occupied nine rows to be filled up

with corresponding information. The other columns have the headings "Duration", "Stimulus", "Media", "Rationale of Selection", and "Activities". The column with the heading "Activities" was further divided into two columns -- "Instructor" and "Learner". These columns were to be filled up with information outlined in Table 5.

TABLE 5

Information Required for Selection of Media and Instructional Activities

Column	Information required
Duration	Amount of time, approximately, needed to conduct the instructional event.
Stimulus	Types of stimulus to be used for the instructional events e.g. spoken words, printed words, pictures, simulation, etc.
Media	Choice of media after considering several candidate media.
Rationale of Selection	Rationale for selecting the media.
Activities (Instructor)	Action by the instructor for the event.
Activities (Learner)	Action by the learner for the event.

Step Five: Preparation of Draft Materials

After the media and instructional activities were selected for each training session, the researcher proceed to prepare a set of draft materials. The draft materials included a training module, the computer presentation visual slides, and the Self-Assessment Form (SAF).

Along with the draft materials, the questionnaire to be used to gather feedback from the participant after the second Small Group Trial – Penilaian Kursus (Course Evaluation) – was also prepared. The researcher decided to prepare it before the Small Group Trials so that it can be reviewed and tested before administration.

Development and Validation of Penilaian Kursus (Course Evaluation)

Chinien and Boutin (1994) contended that if a set of instructional materials is effective, it should generate positive learner attitude. Penilaian Kursus (Appendix F) was designed to collect information about the learner's attitude towards the BasIT training package in order to determine its effectiveness.

Adopting the suggestions of Dick and Carey (1985), Penilaian Kursus probes into the general feelings of the participants towards the BasIT training package. Initially, the questionnaire contained only 18 items – fifteen Likert-scaled items and three open-ended items. The draft copy was reviewed by the research supervisor of the researcher, and minor corrections were made – spelling errors, structure of sentence, etc.

The questionnaire was then tested on the five participants of the first Small Group Trial. Based on their feedback, the researcher realized that more items were needed and three more Likert-scaled items were added to it (items nine, 11, and 12). Item nine was added to assess whether the participants consider the training activities realistic and functional in the setting of the average school – which is one of the research questions in this study. Item 11 was added to probe into the participants' perception of the course assignments – whether the assignments were reasonable and related to the course objectives. Item 12 was used to get the participants' feedback as to whether the visual aids used in the training sessions were suitable and effective.

Item 19 of Penilaian Kursus was initially two separate items – one inquiring about the strength and the other about the weakness of the training materials and activities. The two items were merged to make the questionnaire more concise.

The final version of Penilaian Kursus (Appendix F) contained 18 Likert-scaled items and two open-ended items. The first 18 items in Likert scale collect information about

1. the participants' general feeling about the BasIT training package (items one and two);
2. the participant's feeling about the objectives of the BasIT training package – whether it has clearly defined goals, and whether the materials and activities in the BasIT training sessions were leading them towards the goals (items three, four, eight, and 11);
3. whether the participants found the activities in the BasIT training package easy to follow, relevant to their job, and suitable for the average school setting (item five, six, and nine);
4. whether the materials and visual-aids used were user-friendly and effective (items ten and 12);
5. whether one instructor was capable of handling the training sessions all by himself (item 13);
6. whether the hands-on practice exercises were sufficient for the participants and whether enough time was provided for hands-on practice (item seven and 14);
7. whether sufficient feedback was provided for the participants during the hands-on practice sessions (item 15 and 16);
8. whether the participants have sufficient feedback for their overall performance (item 17 and 18).

The participants were required to indicate their level of agreement – strongly disagree, disagree, agree, or strongly agree – for each of the statements in item one to item 18.

They were forced to take their stand – whether agree or disagree – in making their choices since only four options are provided.

Items 19 and 20 allowed the participants to freely express their opinion. In item 19, they can write down the strengths and weaknesses of the BasIT training package according to their perceptions. In item 20, they were asked to suggest how the BasIT training package can be further improved. This item appealed to the participants, as co-developers of the BasIT training package, to make recommendations in order to improve it.

Step Six: Expert Review

The draft materials developed was evaluated by two experts. Both of the experts are practicing educators who are experienced in the matter of the Internet. One of them a teacher educator in a university and the other an experienced teacher who did her graduate studies in Educational Technology.

The experts were provided with a set of the draft materials – the module, computer slides, and the SAF – and were asked to review the materials and give their comments. One week after they have received the draft materials, the researcher visited them to collect back the materials and get their feedback. During the visit, the researcher talked to the experts and go through with them the entire content of the draft materials. Feedback from the experts concerning the content, instructional strategy, and the presentation format of the materials was obtained.

Step Seven: Revision of the Draft Materials

Based on the comments and recommendations of the experts, the researcher revised the draft materials. As a result, the training materials were improved to be

more presentable and concise. In addition to that, some of the terms used were corrected by referring to the standard Bahasa Malaysia (Malaysian Language) terms for computer technology. The revised materials produced were then used for the Small Group trials.

Step Eight: Small Group Trials

Since the BasIT training sessions were designed to be conducted in the average school setting (school-based approach), limited number of learners per session was expected. Thus, the researcher decided to skip the One-to-One Trials in the stage of formative evaluation and proceed directly to a series of Small Group Trials.

The revised materials were then put through two Small Group Trials among a selected number of teachers in Sekolah Menengah (P) Sri Aman (SMSA, Sri Aman Secondary School), Petaling Jaya, a Pusat Sumber Elektronik (PSE) school. The procedures in conducting the Small Group Trials are described in the following sections.

Site Visit

Being one of the PSE schools, Sekolah Menengah Sri Aman (SMSA), Petaling Jaya was approached to be involved in the Small Group Trials. Upon the approval from the school, the researcher visited the computer room of the school to make sure that the necessary hardware and software was available and in operating condition. The Small Group Trial sessions were then conducted for the selected subjects in the school's computer room.

First Trial

In the first Small Group Trial sessions, the researcher went through the BasIT training sessions – including the use of the Self-Assessment Form (SAF) – with the teachers. Five teachers in SMSA were selected to be involved in these trial sessions. By the end of these trial sessions, the researcher identified some areas to be corrected or improved to produce a more effective package.

Second Trial

The BasIT training materials used in the first Small Group Trial sessions were revised to produce an improved set of materials to be used in the second Small Group Trial. 13 teachers from SMSA were selected to participate in this trial.

At the end of all the sessions, the participants were requested to fill in the Penilaian Kursus (Appendix F) questionnaire to give their feedback about the BasIT training package in general. Based on the feedback gathered, the researcher revised the materials again to produce the first version of the BasIT training package.

Subjects

The subjects for the Small Group Trials were teachers from SMSA. According to Dick and Carey (1985), the subjects should comprise of members of various subgroups in the target populations. Thus, the selected subjects included

- teachers of different subject matters e.g. the arts and sciences
- computer-literates and -illiterates
- teachers varying in age groups and teaching experience.

Due to the absence of male teachers in SMSA, only female teachers were involved in the Small Group Trials.

The subjects were identified through informal and formal means. Informally, the researcher contacted the PSE coordinator of the school and requested her to make recommendations. Formally, the researcher conducted a briefing concerning this study for the teachers and extended invitation to the teachers to be involved. Interested teachers were asked to fill in a form – Asas Internet untuk Guru (Appendix G) – providing information about themselves (computer/Internet experience, teaching experience, subject matter, etc.). In the same form, they have also given their written agreement to be involved in the Small Group Trials, allowing the researcher to make use of their feedback and recommendation to revise the BasIT training package. Based on the information gathered, suitable subjects were then identified.

Data Collection

The first trial was conducted to eliminate obvious errors in the materials and to obtain initial reaction from the target group, which is actually the purpose of the One-to-One Trials according to Dick and Carey (1985). The following strategies were adopted to collect data to achieve these goals:

- The subjects were encouraged to give their feedback and comments any time during the sessions.
- The comments and problems brought up by the subjects were kept in record by the researcher.
- The researcher made correction immediately to any error discovered in the materials with pencil, on the printed page itself.
- After going through all the sessions, the researcher talked to the subjects to see whether they have anything more to contribute to the improvement of the materials.

In addition to all the steps taken in the first trial, the researcher administered a questionnaire – Penilaian Kursus (Appendix F) – after all the BasIT training sessions in the second trial. The responses to this questionnaire added to the information gathered in order to further improve the package.

Step Nine: Production of the First Version of the BasIT Training Package

Based on the feedback gathered in the Small Group Trials, the researcher re-evaluated and revised all the training materials developed thus far. This resulted in the production of the first version of the BasIT training package, which included

- The training module
- An introduction pamphlet to introduce the package
- The instructor's manual
- Overhead transparencies
- Self-Assessment Forms (SAF)
- Certificate of performance
- Floppy diskette – contained computer software e.g. Microsoft Powerpoint Viewer, computer slides, etc.

Summary

The methodology of this study was based upon the suggestions of many ID researchers (Dick and Carey, 1985; Gagne and Briggs, 1979; Kemp, 1985; Kemp and Smellie, 1989; Leshin, Pollock, Reigeluth, 1992; Seels and Glasgow, 1990; Tessmer and Wedman, 1990; Thiagarajan, 1990, 1991). It began with needs assessment, followed by task analysis, definition of instructional objectives, selection of media

and instructional activities, and the formative evaluation of the BasIT training package produced.

The methods used for data collection were survey by questionnaire (Needs Assessment and Small Group Trials), consultation (Needs Assessment and Expert Review), observation (Small Group Trials), and interviews (Small Group Trials). The source of data was the subjects selected – the JP teachers and PSE teachers for Needs Assessment, the experts in Expert Review, and the selected participants in the Small Group Trials.

The subjects involved in the Needs Assessment were 50 JP teachers and 14 PSE teachers. They were selected as subjects because they have been exposed to the Internet through training provided by their respective project organizers. As practicing teachers, they were also more likely to provide useful information about the facilities in the schools and the teachers' needs related to the Internet. A survey instrument – Analisis Keperluan: Kursus Internet Untuk Guru-guru (Appendix A) – was developed by the researcher with the help of his research supervisor for this purpose. The instrument was tested on two teachers in Sekolah Menengah Bukit Bandaraya (Bukit Bandaraya Secondary School), Kuala Lumpur – which is a JP school – before being administered. It was mailed to the subjects (electronically or by post). Sixty-one out of the 64 responded.

To design and develop the BasIT training package, the researcher had designed several instruments. The forms entitled Task Analysis, Analysis of Instructional Objectives, Learning Tasks and Their Objectives, and Selection of Media and Instructional Activities were used in performing task analysis, defining instructional objectives, and selecting appropriate media and instructional activities.

After that, the researcher developed a set of draft materials and submitted it to be reviewed by the experts.

The service of two experts were engaged for this study. They reviewed the draft materials developed by the researcher; advised the researcher as to the accuracy and the sequence of the content, the effective use of media and visual aids, and appropriate use of instructional strategies; and provided suggestions for the revision of the materials.

The draft materials were then revised and subjected to the Small Group Trials. The researcher conducted the first trial with five teachers as participants in SMSA, Petaling Jaya, one of the PSE schools. Errors found in the training materials were corrected to produce a better package.

The revised BasIT training package after the first Small Group Trial was used in a second Small Group Trial with 13 teachers as participants in the same school. The participants gave their feedback through the questionnaire entitled Penilaian Kursus (Appendix F) after all the BasIT training sessions. The questionnaire Penilaian Kursus was developed by the researcher with the help of his research Supervisor. It was tested on the five participants in the first trial. After the Small Group Trials, the feedback gathered analyzed and used to revised the existing BasIT training package. Finally, the first version of the BasIT package was produced.