CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the design and evaluation of the computer-based instructional courseware.

3.1 The Design

Designing the courseware was done during the Multimedia class, Semester I of 1997 / 1998. Three credit hours per week were allotted for this course and a total of 45 credit hours were required to complete the course. For this study, A Poem was selected and the researcher had to revise the design so that this lesson could be run independently of the other sub-modules.

Each CBI lesson was designed on paper in screen forms or also known as 'storyboarding' (Appendix A). These screens were designed and assembled with precision in the exact sequence as they would appear on the computer. After the completion of the screens, flowcharting was done to enable the programmer to author the courseware modules. The programming of the lessons was undertaken by a production house, AccuMedia Sdn. Bhd., a firm specialising in authorware.
3.2 A Poem

This activity-based lesson is entitled *A Poem*. It is based on the poem, entitled *Throwing A Tree* written by Thomas Hardy (Appendix B). To cater for the different learning ability groups, the researcher had to simplify the poem. (Appendix C) Nevertheless, the main idea or message of the poem was retained and the researcher entitled it *Throwing Down A Tree*.

3.3 Structure of the Lesson

The structure of the lesson and the sequence is shown in Figure 6. The activities in this lesson are based on the poem *Throwing Down A Tree* (Screen 1). There are separate screens for the following namely, purpose (Screen 2), poem (Screen 3), glossary (Screen 4) and the activity menu (Screen 5). The screen on the purpose identifies the objectives of this lesson. The screen on the poem displays the simplified poem and the screen on glossary displays a list of difficult words and their meanings. Finally, the activity menu displays a list of options namely, interpret the poem, add graphics, sequence pictures, poem activities and writing activities.
From the screen on *Interpret the Poem*, the learners could either choose the option 'own' or 'guided'. The selection of the option by the learners would indicate their level of proficiency in the English language. For instance, if the learners clicked option 'Own', they would be led to click MsWord (Microsoft Word) which would allow them to do the activity on their own, and this would reflect a higher level of proficiency. On the other hand, if they had clicked 'guided', they would be led to complete a guided activity and this would reflect a lower level of proficiency.

Another topic that requires the learners to complete the activities on their own is *Create Writing Activities*. Here the learners would click MsWord and the researcher helps specify the path before the MsWord could be executed. Once the path has been specified, learners could complete the activity. *Create Writing Activities* and *Own* are designed to gauge the learners' mastery of the English language and to allow them to freely capitalise on their creativity. The document file in the MsWord allows them to take advantage of the spell checker while attempting their writing activities. Furthermore, it allows the learners the option of saving their file, print it or even e-mail it. However, the whole lesson has been designed to cater for computer literate learners.

On the other hand, learners could also click *Guided* (Screen 10) as on screen, *Interpret the Poem*. This activity requires the learners to fill each blank with appropriate words selected from a given box of words.
This activity is designed to test the learners' vocabulary. If the learners selected a wrong word for the blank space, they would not be able to continue. As such, they have to get access to the glossary and pick the correct word and then continue with the exercise.

As for the activity, *Add Graphics to Make the Poem Interesting* (Screen 13) it was organised to enable the learners to visualise the appropriate graphics that matched the word or words in *Throwing Down A Tree*. The graphics were hand-drawn and pencil-coloured to attract the learners' attention. Learners could check their answers from the feedback given. Graphics that did not match the words or phrases in the poem would bounce back to their original spot. The learners could try a maximum of four times to get the correct graphics in place.

*Do more Poem Activities* (Screen 21) was designed to enable the learners to:

i) spell and type the words correctly in the space provided

ii) select the correct response from the multiple choice questions

iii) sequence the sentences according to the events in the poem.

Feedback for all the three activities was given. If the learners failed to provide the right word in the blank space, they would be guided to
read the poem but if they fail again, they would be led to the glossary screen. After the third attempt, the correct answer would be provided automatically. For the multiple choice questions and the sequencing exercise, answers that did not fit the blank space would jump back to its original spot, thus indicating that it had been wrongly selected. The learners had to try until all answers fit correctly. In this process, learning is not only reinforced, the learners are able to retain knowledge.

3.4 Gagne's Nine Events

The lesson, which incorporates Gagne’s Nine Events would begin with screen one where the learners’ attention would be captured by the introduction of the poem’s title and the colourful picture of a tree being sawn by two men (Event One: Gaining Attention). In the next screen, the learners would be presented with the purpose of the lesson as to what the learners would be required to do (Event Two: Presenting the Lesson’s Objectives). This would be followed by the scrolling text of the poem, *Throwing Down A Tree* (Event Four: Presentation of Stimulus). The learners’ prior knowledge on the role of loggers and executioners would be useful, as it would help the learners to further enhance their understanding of the executioners’ ‘task’ as ‘they approached the trees’ (Event Three: Recall of Prior Knowledge).
Figure 6: The Structure of A Poem
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The Glossary, for instance, would provide helpful guidance to the learners in the understanding of the poem (Event Five: Providing Learning Guidance). The activities outlined would require the learners' ability to complete the tasks (Event Six: Eliciting Performance). All the activities except writing, would provide the learners with feedback on their performance (Event Seven: Providing Feedback). These activities were designed to assess the learners' performance (Event Eight: Assessing Performance). Finally, to enhance learning, the learners would be given exercises. For example, in "Doing more Poem Activities, the learners would sequence sentences according to the events in the poem and to transfer knowledge, the learners would complete the writing activities in Creating Writing Activities. These writing activities would provide sufficient input for the learners to write a similar poem or short story or a dialogue (Event Nine: Enhancing Retention and Transfer). The above interactive activities would allow for active participation on the part of the learners and help them remain attentive.

Furthermore, the use of the icons at the bottom of each screen would allow them to gain control over the lesson. Once the learners are familiar with the functions of the icons and the buttons, they could maneuver their directions. They could interact with the activities at their own pace and choose to exit and then continue later. The average learners would normally take a shorter time to complete the lesson.
compared to below average learners. Thus, the amount of time the learners take to complete a lesson greatly depends on their English language proficiency level.

To motivate student learning, the colour schemes were carefully and meaningfully selected. The rainforest formed the background for most screens. As the theme of the poem was deforestation, it was seen appropriate to see beauty in the trees. The lesson hoped to create awareness among the learners to appreciate nature and the environment. There were also screens that used light colours and this added variety and catered for easy reading.

3.5 Instructional Strategy

The instructional strategy is based on Gagne's Nine Events of Instruction. The learners began their lesson by clicking to screen one, which displays the title of the poem. Screen 2 displays the purpose of the lesson followed by the poem on screen 3. Should the learners have vocabulary problems while comprehending the poem, they could click to Glossary on screen 4, otherwise they could go straight to the Activity Menu on screen 5. The Activity Menu displays a list of options namely, interpret poem, add graphics, sequence pictures, poem activities and writing activities.
The learners could click any one of the options displayed on the Activity Menu. Let us assume that the learners click the *Interpret Poem* option. This would instruct them to choose option *Own* or *Guided*. If the learners chose option *Own* (Screen 7), they would be led to screen 8 which is the path to *Msword* and finally, screen 9, which is the document window. Learners who need guidance would opt for option *guide* which would take them to screen 10. They would then work on the exercises on screen 11 and then screen 12 would provide them with the feedback. Having completed screen 12 the learners would click to *Activity Menu* on screen 5.

The *Activity Menu* on screen 5 displays a list of options for the learners to continue. The learners would now select the next activity, that is, *Add Graphics* (screen 13) and they would work on the exercises on screens 14-18. Having completed these exercises, the learners would click to *Activity Menu* on screen 5. This Activity Menu would display all the options and the learners would decide to select sequence pictures (Screen 19-20) and work on the exercises. Having completed screen 20, they would click back to *Activity Menu* (Screen 5).

This Activity Menu would again display all the options and the learners would now click *More Poem Activities*. This would lead the learners to poem activities on screen 21. Having read the instructions, the learners would answer question one on screen 22, question 2 on
screen 26, question 3 on screen 27 and subsequent exercises on screen 28. The point to note here is that the learners could proceed forward or backward from screen 22 to screen 29 by clicking on the icon identified for this activity which is at the bottom of the screen. Upon completing the exercises on screen 29, the learners would go back to the Activity Menu (screen 5).

The Activity Menu would again display all the options, and the learners could click option Create Writing Activities and this would lead them to screen 30. Having read the instructions, the learners could attempt the dialogue on screen 31. While screen 32-33 identifies the path to MsWord, screen 34 is the short story. Having attempted the short story, learners are led to a poem in screen 35. A point to note at this juncture is that the learners could proceed forward or backward from screen 31 to 35 with the help of the icon button which is at the bottom of the screen.

The learners would now go back to the Activity Menu (screen 5) to check whether all the activities had been attempted. The button for each activity listed would change its colour thus indicating that the activity had been attempted. When learners have completed all the activities, they could exit the programme by clicking on the exit icon. Screen 36 would enable the learners to quit the programme or restart the lesson from the beginning by clicking on the 'No' command.
3.6 Subjects

This study was administered on a sample of three try-out learners from Sekolah Menengah Agama Sheikh Hj. Mohd. Said, Seremban. This school was selected because of three reasons:

i) the researcher has been an English language teacher in this school since 1985

ii) the school has a computer room which is well equipped with twenty computers

iii) a formal literacy project is part of the school's extra-curricular programme and has been introduced to all the students since 1997.

Three students whose English language proficiency levels are above average, average and below average were selected as try-out students for this study. (Table 4). These students, with different language abilities were selected based on their performance in the English Languages tests held in March and April 1998.
<table>
<thead>
<tr>
<th>English Language Ability Levels</th>
<th>Marks Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Average</td>
<td>76 – 100</td>
</tr>
<tr>
<td>Average</td>
<td>50 – 75</td>
</tr>
<tr>
<td>Below Average</td>
<td>0 - 49</td>
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</tbody>
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Table 3: English Language Ability Levels

3.7 Pilot Test

The student Evaluation Questionnaire was piloted on a group of ten form four students who were selected at random from Sekolah Menengah Kebangsaan Agama Sheikh Hj. Mohd. Said, Seremban. The distribution of the respondents in the group are as follows: five girls and five boys. All the ten students have some working knowledge of the computer.

The questionnaire is divided into two sections namely, Section A and B. Section A has 36 statements based on Gagne's Nine Events of Instruction while Section B has eleven statements reflecting learners' attitudes toward the prototype multimedia courseware for instruction. The respondents rated each statement according to the extent to which they agreed or disagreed with it.
Before administering the questionnaire, the ten students were given a briefing on the purpose of the pilot test and what was expected of them. They were advised to fill in the questionnaire and write down any comments they might have about the statements or difficulties they encountered while answering them. The statements were also discussed to ensure that the respondents understood the intended meaning.

The results showed that the questionnaire is valid and reliable in its purpose but not without some minor comments. The comments were noted and the researcher made some final adjustments to the questionnaire (Appendix D).

3.8 Research Instrument

3.8.1 Learners' Evaluation Questionnaire:

This questionnaire (Appendix D) is divided into two sections. Sections A is based on the items as listed in Gagne’s Nine Events of Instruction. The aim was to seek learners’ feedback on the activities and this was administered after the learners had completed the entire lesson. Section B is aimed at gauging the learners’ attitude toward using computer-based instructional courseware.
3.8.2 Observation

The researcher noted the learners' non-verbal responses towards the use of the computer-based instructional courseware and these either verified or confirmed the researcher's other findings.

3.8.3 Interview

A short informal interview session was also conducted separately with the three learners after they had completed the entire lesson (Appendix E). Learners were asked on their perception towards the courseware, their problems and difficulties, and suggestions they wished to offer.

3.9 Procedure

The three selected try-out students were briefed individually on the evaluation process, the objectives of this study and what they had to do. They were encouraged to discuss with the researcher when they encountered difficulties with the activities and write their comments on the storyboards which were given to them at the start of the evaluation process. They were also informed that whatever difficulties they
encountered while interacting with the instructional materials were not totally a result of their own shortcomings but rather the courseware.

The next step was the one-to-one evaluation between the researcher and the learners and this was done individually on separate days. Before the learners started on the computer, they were given a paper version of the computer display (Appendix A). They were asked to write their comments on this paper version whenever they encountered difficulties while interacting with the activities. They discussed their problems and suggestions with the researcher who noted them as field notes.

The researcher also observed their non-verbal responses as they worked through their activities. Observing their non-verbal responses enabled the researcher to determine whether they were having difficulties or enjoying their lesson. The researcher also recorded their performance in the exercises given and the length of time taken to complete each activity.

Having completed all the activities, a Student Evaluation Questionnaire (Appendix D) was administered. This questionnaire is divided into two sections: Section A is based on Gagne's Nine Events of Instruction (Table 2) and Section B is based on learners' attitudes toward using a computer-based instruction.
The analysis of this study took into consideration the following:

i) learners’ response to the lesson based on Gagne’s Nine Events of Instruction

ii) learners’ response to the questionnaire regarding their attitudes toward using a computer-based instruction

iii) learners’ comment, ideas, problems and suggestions

iv) researcher’s observations on the learners’ non-verbal responses.